SOME RELATIONSHIPS AMONG PARTICLE SIZE, MASS LEVEL AND RADIATION INTENSITY OF FALLOUT FROM A LAND SURFACE NUCLEAR DETONATION

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ABSTRACT

The simulation of a realistic fallout environment was required for the design of experiments to evaluate post-nuclear attack reclamation equipment and procedures. A simplified mathematical fallout model was utilized to estimate fallout particle sizes, accumulated initial mass levels, and standard radiation intensities that might occur under specified conditions of weapon yield and downwind distance from a land surface nuclear detonation. Fallout particle size, deposited mass per unit area, and standard radiation intensity, as functions of downwind distance and weapon yields from 1 KT to 100 MT are presented graphically to facilitate rapid selection of simulated fallout environments.

SUMMARY

Problem

Particle size and accumulated mass are two important fallout characteristics whose interrelationships have not been explicitly presented in published fallout model reports and which affect decontamination processes involving the physical removal and disposal of fallout from a land surface nuclear detonation. The simulation of spatial variation of these two characteristics within the fallout pattern would make possible a systematic and thorough evaluation of post-nuclear attack reclamation equipment and procedures not feasible under weapon test conditions. A method of estimating fallout particle size and accumulated mass under specified conditions of weapon yield and downwind distance from surface zero could be used to design reclamation experiments.

Findings

A simplified mathematical fallout model was applied to define fallout particle size spatial distribution in an idealized meteorological environment. The variation in deposited fallout mass per unit area with weapon yield and downwind distance for a dry land surface nuclear detonation were determined from equations developed by Miller.[1,2] Graphical presentation of the fallout parameters of particle size, accumulated mass level, and standard radiation intensity, as functions of downwind distance from surface zero for 21 weapon yields from 1 KT to 100 MT, can facilitate the design of reclamation experiments. Either specially prepared synthetic fallout can be used to simulate a desired post-attack environment, or, more practically, a commercially available fallout simulant raw material can be adapted by minimal processing to suit some realistic environment.

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SECTION 1

INTRODUCTION

Methods and equipment that might be used to remove radioactive fallout resulting from a land surface nuclear detonation have been difficult to evaluate under weapon test conditions. The principal difficulties have been lack of environmental control, low priority, and conflicts with other test objectives. Uncertainties in the prediction of the fallout location present problems in the pretest selection and preparation of areas suitable for reclamation evaluation studies. Even if a sufficient number of suitable sites could be selected and prepared the cost of logistic and analytical support would be prohibitive. At past weapon tests neither the funds nor priority has been available for such reclamation projects for conditions other than a limited number of fallout environments. A method of simulating expected fallout environments would permit controlled test conditions required to obtain comprehensive evaluations of reclamation procedures.

From samples obtained at many weapon tests the basic properties of fallout at specific locations have been determined. From the unique combinations of fallout properties of radiation intensity, particle size and deposited mass per unit area at measured points, within the fallout pattern mathematical models of their continuous spatial variation have been developed. The input or independent variables of these models is usually weapon yield, cloud geometry, a meteorological model of the particle transport process and some assumed particle size-radioactivity distribution. The output of most models to date is suited to the specific requirements of civil defense and military operations where the prediction of dose rate contours is of primary interest.

The purpose of the present work is to apply a suitable fallout model to the design of reclamation experiments where the fallout physical properties of particle size and deposited mass level are of importance. Although particle size and deposited mass levels are inherent in the development of most models, they are not shown in an explicit readily applicable form.

Application of a fallout model developed by Miller[1,2] provides a means of estimating fallout particle size and deposited mass levels for the range of expected values as functions of weapon yield, dose rate, and downwind distance. This simplified fallout model: (a) correlates experimental data by a simplified computational method that is self-consistent and in reasonable agreement with the existing data; and (b) computes by interpolation, and, to some extent, extrapolates fallout data to predict contaminating conditions pertinent to the design of reclamation experiments.

Estimates of fallout properties of radiation intensity, particle size and deposited mass level can be made by judicious use of the fallout model which yields numerical values for these quantities. Control of each of the above properties permits determination of their separate effects upon reclamation effectiveness and the establishment of interrelationships producing optimum performance.

1.1 OBJECTIVE

Using Miller's land surface detonation fallout model as a starting point, it was intended to:

(a) Apply the model theory to determine particle sizes, mass levels and radiation intensity as a function of weapon yield and downwind distance.

(b) Solve the model scaling equations for a sufficient number of weapon yield values to establish the fallout model parameters in detail.

(c) Present a simplified method for determining realistic fallout environments for reclamation experiments.

SECTION 2

THEORY OF FALLOUT PARTICLE SIZE, RADIATION INTENSITY, AND DEPOSITED MASS LEVEL

Representation of a complex physical phenomenon such as the generation and distribution of fallout is difficult. From the fireball chemistry of fallout formation to the final deposition on the ground through an ever-changing meteorological environment a lack of valid data limits the accuracy of any fallout pattern prediction method. The following theoretical development provides a systematic method of estimating fallout environments useful in the design of reclamation experiments.

2.1 ASSUMPTIONS

The following assumptions were made either for simplification of the mathematics or because of the lack of valid data.

1. The cloud source of particles (at about 6 to 8 minutes after detonation) when a stabilized cloud has the shape of an oblate spheroid (Fig. 1) where 2a is the major axis or diameter parallel to the ground and 2b is the minor axis or vertical thickness of the cloud.

2. The particles of a given size parameter, α, to be defined later, fall with a constant terminal velocity vector, v_f, from their position in the cloud to the ground.

3. The wind velocity, v_w, is constant with a speed of 15 mph for all altitudes from the ground to the top of the cloud within the area of the fallout pattern.

4. The spatial distribution of particles of each size-parameter in the cloud is uniform.

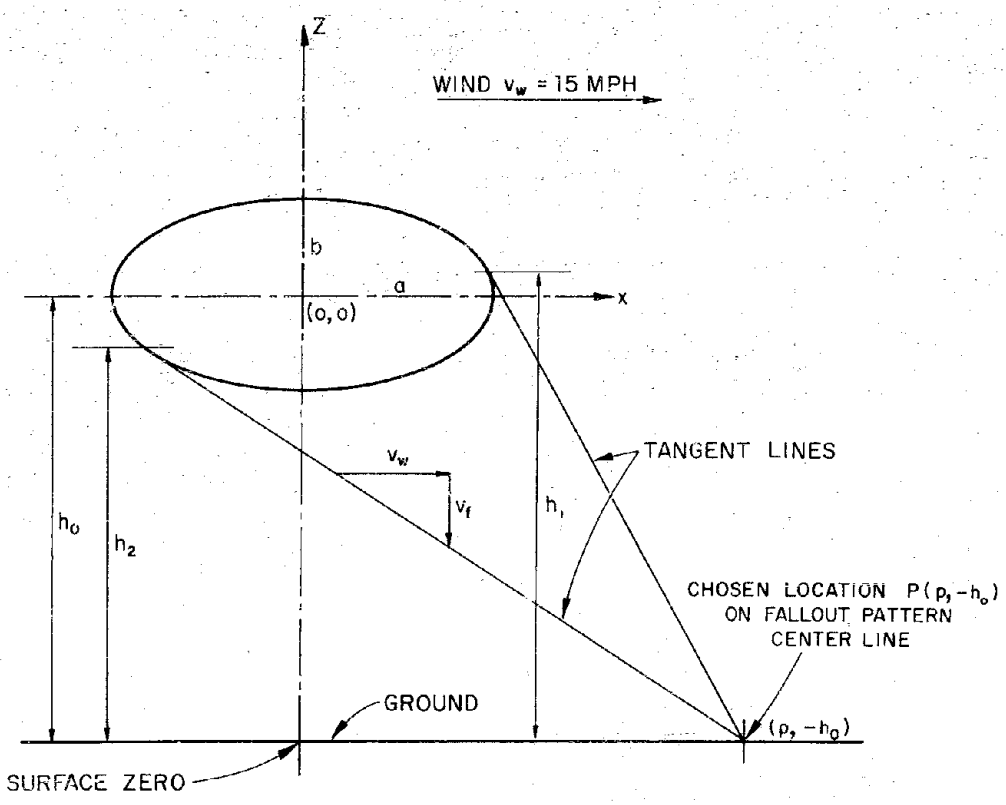


Fig. 1 Geometry of Simplified Mathematical Model of Fallout Arrival From Cloud.

5. The fraction of the total activity on each particle size group can be determined from fallout data as a function of a falling velocity parameter.

6. Fallout particles are irregular in shape but, for the purposes of computing particle terminal velocities, are represented, by cylindrical shapes of diameter d and length 2d with a density of 2.6 gm cm^{-3}.

2.2 LIMITATIONS

The following limitations were placed on the present application of the model for the design of reclamation experiments:

1. Only downwind distances beyond the thermal and blast damage area are considered.

2. Close in throwout material and fallout from the cloud stem are not included.

3. No fallout areas are considered where the intensity is less than 1 r/hr at 1 hour.

4. Only locations on the downwind centerline of the pattern are considered, representing, according to the model, the maximum mass level that can occur at a given distance.

5. All calculations and interpretations of the simplified mathematical fallout model apply only to a land surface nuclear detonation.

2.3 FALLOUT CLOUD GEOMETRY

The simplified mathematical fallout model for a land surface detonation[2] defines the familiar mushroom cloud as an ellipsoid of revolution about the minor axis 2b, with a diameter 2a and the center at a height h_o above surface zero (Fig. 1). The present analysis and calculations were made only for the downwind vertical center plane profile of the cloud whose equation is

$$\frac{X^2}{a^2} + \frac{Z^2}{b^2} = 1 \qquad (1)$$

with the origin at height h_o above surface zero.

The scaling equations[2] for cloud geometry 6 to 8 minutes after detonation, when maximum symmetrical size with minimum distortion by wind has occurred, are

$$a = 2.45 \times 10^3 \, W^{0.431} \text{ ft}, \quad W = 1 \text{ KT to } 10^5 \text{ KT} \qquad (2)$$

$$b = 1.40 \times 10^3 \, W^{0.300} \text{ ft}, \quad W = 1 \text{ KT to } 10^5 \text{ KT} \qquad (3)$$

$$h_o = 0.66 \times 10^4 \, W^{0.445} \text{ ft}, \quad W = 1 \text{ KT to } 28 \text{ KT} \qquad (4)$$

$$h_o = 1.68 \times 10^4 \, W^{0.164} \text{ ft}, \quad W = 28 \text{ KT to } 10^5 \text{ KT} \qquad (5)$$

where W is the total weapon yield (fission + fusion) in equivalent kilotons of TNT, and a, b, and h_o are the cloud dimensions shown in Fig. 1.

2.4 FALLOUT PARTICLE SIZE VS. DISTANCE FROM SURFACE ZERO

Using the assumptions, limitations, and fallout cloud geometry given above, the relationship between fallout particle size and downwind distance from surface zero will be derived.

Figure 1 shows the downwind center plane geometry of the simplified mathematical model of the fallout cloud and should be referred to in the derivation that follows.

A particle size parameter α is now introduced and defined as:

$$\alpha = \frac{v_w}{v_f} = \frac{dx/dt}{dz/dt} = \frac{dx}{dz} \qquad (6)$$

where v_w = wind speed (ft/sec)
v_f = average particle terminal velocity (ft/sec) from its initial position in the cloud to sea level.

Any chosen location P on the ground a distance greater than the cloud radius a downwind from surface zero receives fallout particles from the cloud which travel along paths between the two lines tangent to the cloud from P. Particle terminal velocity v_f varies with particle size, and the path with minimum slope (α_{max}) is associated with the smallest particle arriving at P. Similarly, the path with maximum slope (α_{min}) is associated with the largest particle arriving at P. Particles arriving along paths between the two tangents to the cloud would have intermediate terminal velocities corresponding to intermediate particle sizes. Thus, a range of particle sizes is determined at any point P beyond the cloud radius for any cloud geometry determined from Eqs. 2 through 5.

The general solutions for the reciprocals of the slopes of the lines tangent to the cloud ellipse (Eq. 1) from P, $(P,-h_o)$ are

$$\alpha_{min} = \frac{hp - \sqrt{p^2b^2 + a^2(h_o^2-b^2)}}{h_o^2-b^2} \tag{7}$$

$$\alpha_{max} = \frac{hp + \sqrt{p^2b^2 + a^2(h_o^2-b^2)}}{h_o^2-b^2} \tag{8}$$

where a, b, and h are defined by Eqs. 2 through 5.

The altitudes of the two tangent points on the cloud, which are the approximate starting points, respectively, of the largest and smallest particles arriving at P are:

$$h_1 = \frac{\alpha_{min} b^2}{+\sqrt{a^2 + \alpha_{min}^2 b^2}} + h_o, \text{ for largest particle} \tag{9}$$

$$h_2 = \frac{\alpha_{max} b^2}{-\sqrt{a^2 + \alpha_{max}^2 b^2}} + h_o, \text{ for smallest particle} \tag{10}$$

To calculate the particle size range arriving at point P, the following steps are taken:

(a) Compute a, b, and h_o from Eqs. 2 through 5 using a given yield W.

(b) Compute α_{min} and α_{max} using Eqs. 7 and 8 for the given location P.

(c) Compute initial altitudes associated with smallest and largest particle using Eqs. 9 and 10.

(d) Compute v_f values associated with α_{min} and α_{max} using Eq. 6 and some typical assumed value of v_w (15 mph for this application of the model).

(e) Interpolate from Table A.1 (Appendix A) to find the particle sizes associated with the initial altitudes and v_f values computed in steps (c) and (d).

2.5 RADIATION INTENSITY AND DEPOSITED MASS LEVEL

Standard radiation intensity is defined as the observed radiac dose rate 3 feet above a uniformly contaminated open area produced by the total deposited fallout corrected for decay to 1 hour after detonation. The reference radiac instrument is the AN/PDR-39 (T1B) portable radiac which has a geometric and photon energy response very close to 0.75 of the true air ionization rate 3 feet above a plane source of fission products uniformly distributed on the area.

Since standard intensity is related to the deposited fallout mass, as described below, establishing the variation of standard intensity with weapon yield and downwind distance is required. Yield-dependent scaling equations developed by Miller[1] define the significant intensity profile features of a surface burst of 100 % fission yield and a wind speed of 15 mph. These features, the cloud shoulder, the downwind peak and the 1 r/hr at 1 hr point are shown in Appendix C, Figure C.1. The scaling equations and solutions for 21 specific yields are also given in Appendix C.

The ratio of fallout mass per unit area to the ionization rate 3 feet above an extended area covered with fallout is defined as the mass contour ratio and can be expressed mathematically as

$$M_r(t) = \frac{M_p}{I_p(t)} \qquad (11)$$

where $M_r(t)$ is the mass-contour ratio at a given time (t), M_p is the mass of fallout per unit area at a given location P, and $I_p(t)$ is the observed ionization rate at the same time t and location P. If the value of the mass-contour ratio $M_r(1)$ at one hour after detonation and the standard intensity $I_p(1)$ at a given location P are known or can be estimated, equation (11) can be used directly to find the initial mass level. Although some recent estimates of the downwind distance dependence of $M_r(1)$ on yield have been made[2] as presented in Table C.2, a constant value of 0.030 g/ft^2 per r/hr at 1 hr[4] has been assumed for application of the model to date. The standard radiation intensity $I_p(1)$ at a given location P downwind from a weapon detonation of yield W can be obtained from graphical (on a semi-log plot) or mathematical interpolation between the cloud shoulder, the downwind peak and the 1 r/hr at 1 hr points defined by the yield dependent scaling equations in Appendix C. Using the interpolated values for $I_p(1)$ and a value of 0.030 for $M_r(1)$ the initial mass levels at point P reduce equation (11) to

$$M_p = 0.030\ I_p(1)\ \text{gm/ft}^2 \qquad (12)$$

SECTION 3

SCOPE OF MODEL AND ITS APPLICATION TO RECLAMATION EXPERIMENT DESIGN

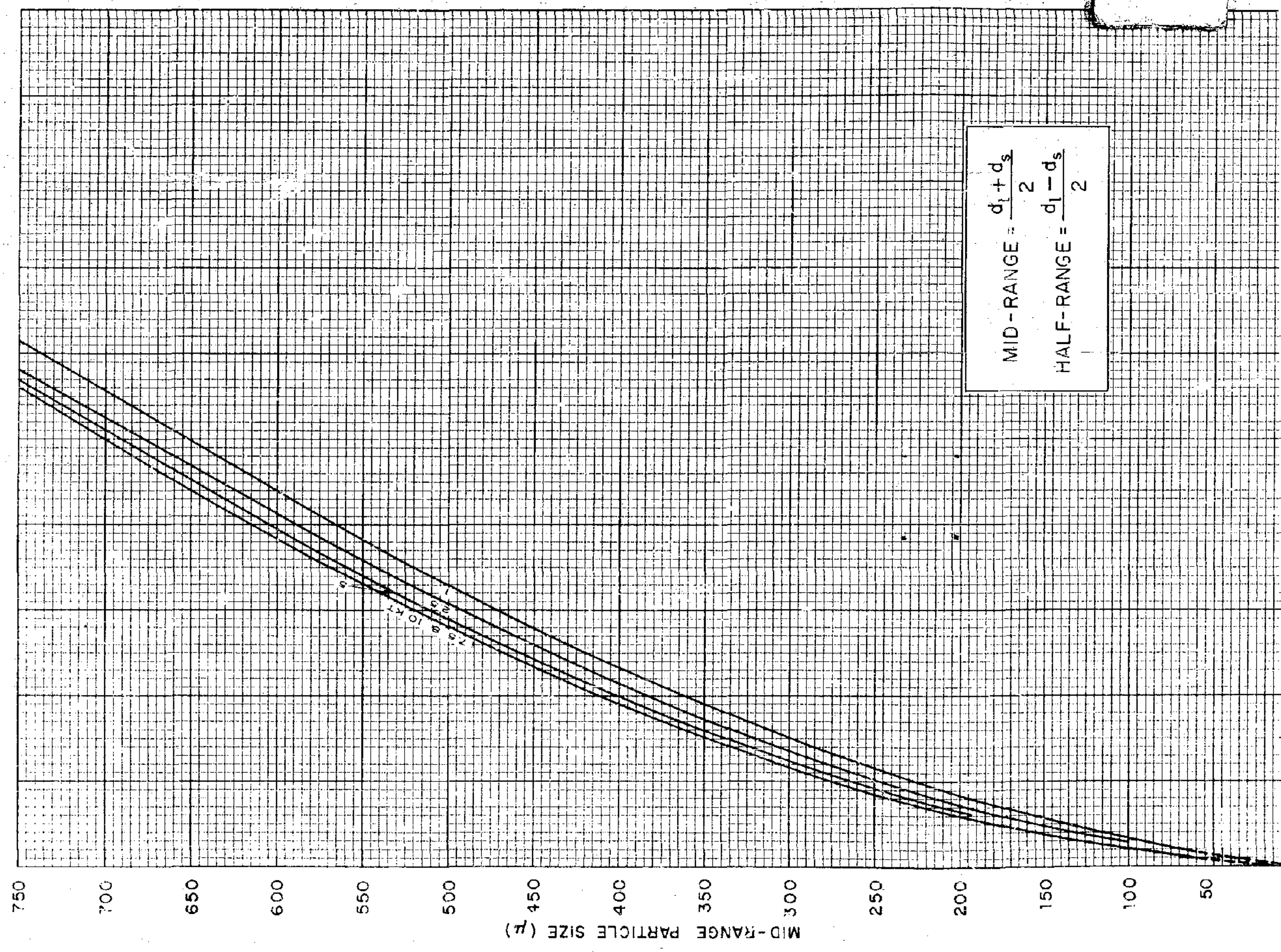
3.1 SCOPE OF CALCULATIONS

To establish the range of values for fallout parameters of particle size, mass level, and standard intensity as functions of downwind distance, the model scaling equations were solved at 21 discrete weapon yields from 1 KT to 10^5 KT. The cloud dimensions defined by scaling Eqs. 2 through 5 are summarized in Table B.1. Table A.1 gives terminal velocity vectors v_f(ft/sec) based on the most recent NRDL terminal velocity equations for irregular particles of different sizes falling from a given initial altitude to sea level, and was used in conjunction with Eqs. 6 through 10 to determine particle size range as a function of downwind distance. The significant intensity profile features shown in the diagram of Fig. C.1 were calculated using equations in Appendix C and are summarized in Table C.1. Equation 12 was evaluated at a sufficient number of downwind locations to define the variation of mass level with downwind distance.

3.2 APPLYING THE MODEL

To facilitate application of the idealized model to the design of reclamation experiments, Figs. 2, 3 and 4 are presented to show graphically the relationships of some of the fallout environment parameters. The use of these four graphs permits rapid determination of particle size range, downwind distance, initial mass, and standard radiation intensity for any of the 21 given yield values used in the computations.

1



MID-RANGE = $\frac{d_l + d_s}{2}$
HALF-RANGE = $\frac{d_l - d_s}{2}$
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
MID-RANGE PARTICLE SIZE (μ)

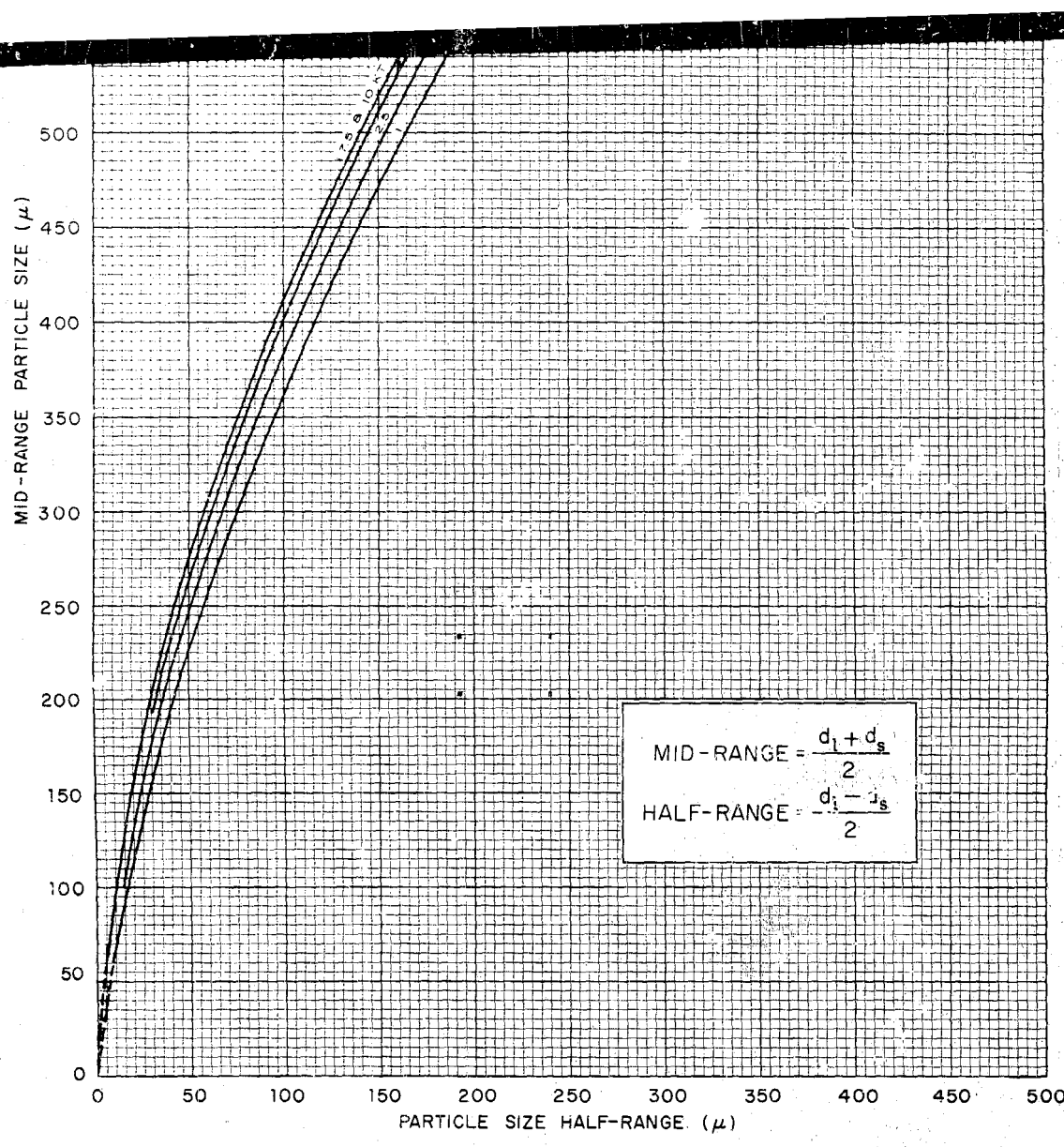
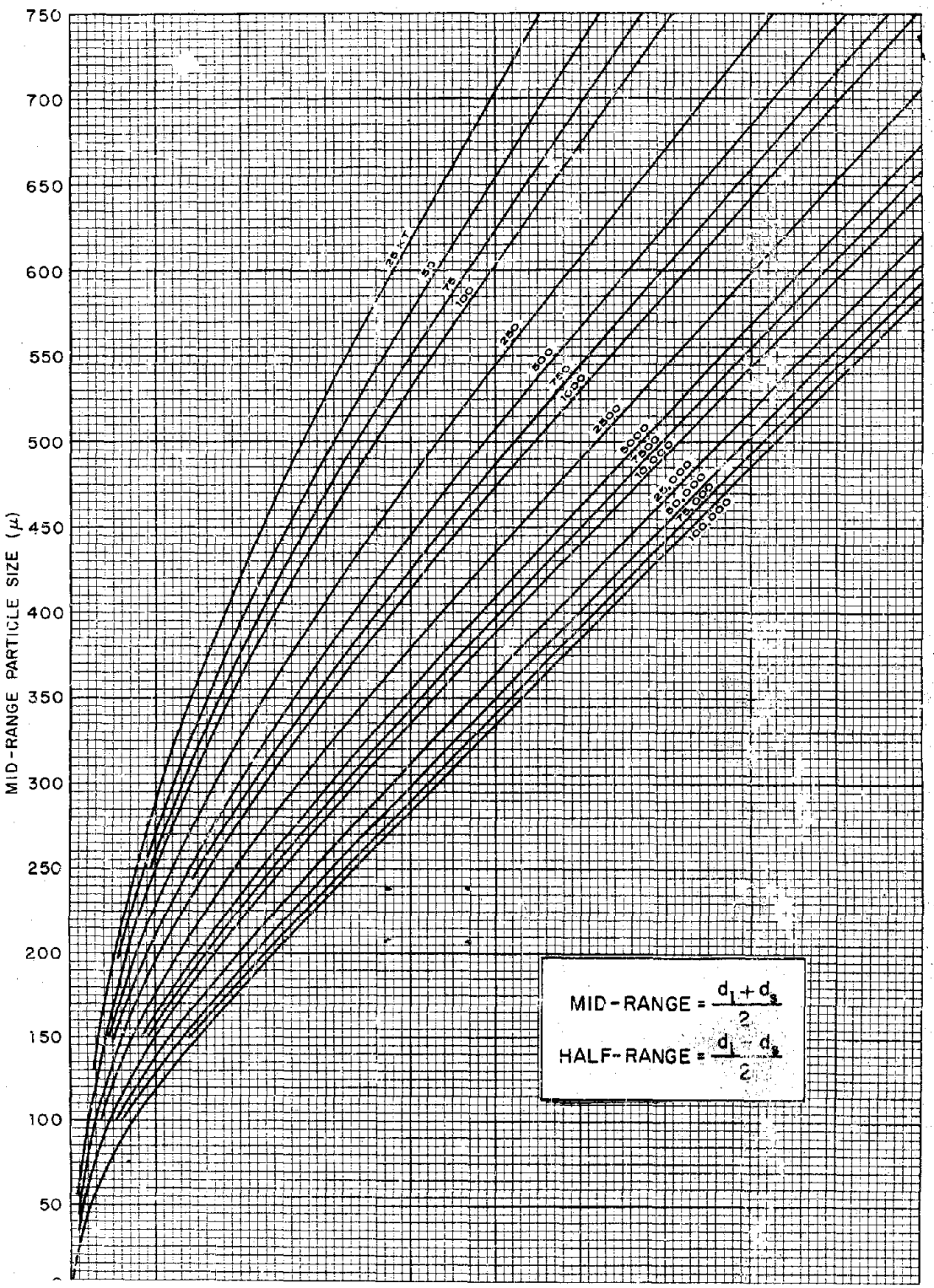


Fig. 2A Curves Used to Determine Weapon Yield Producing Fallout With Given Physical Properties Defined by Mid-Range Particle Size and Particle Size Half Range


MID-RANGE PARTICLE SIZE (μ)
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
25-T
50
75
100
250
500
750
1000
2500
5000
7500
10,000
25,000
50,000
75,000
100,000
MID-RANGE = $\frac{d_1 + d_2}{2}$
HALF-RANGE = $\frac{d_1 - d_2}{2}$

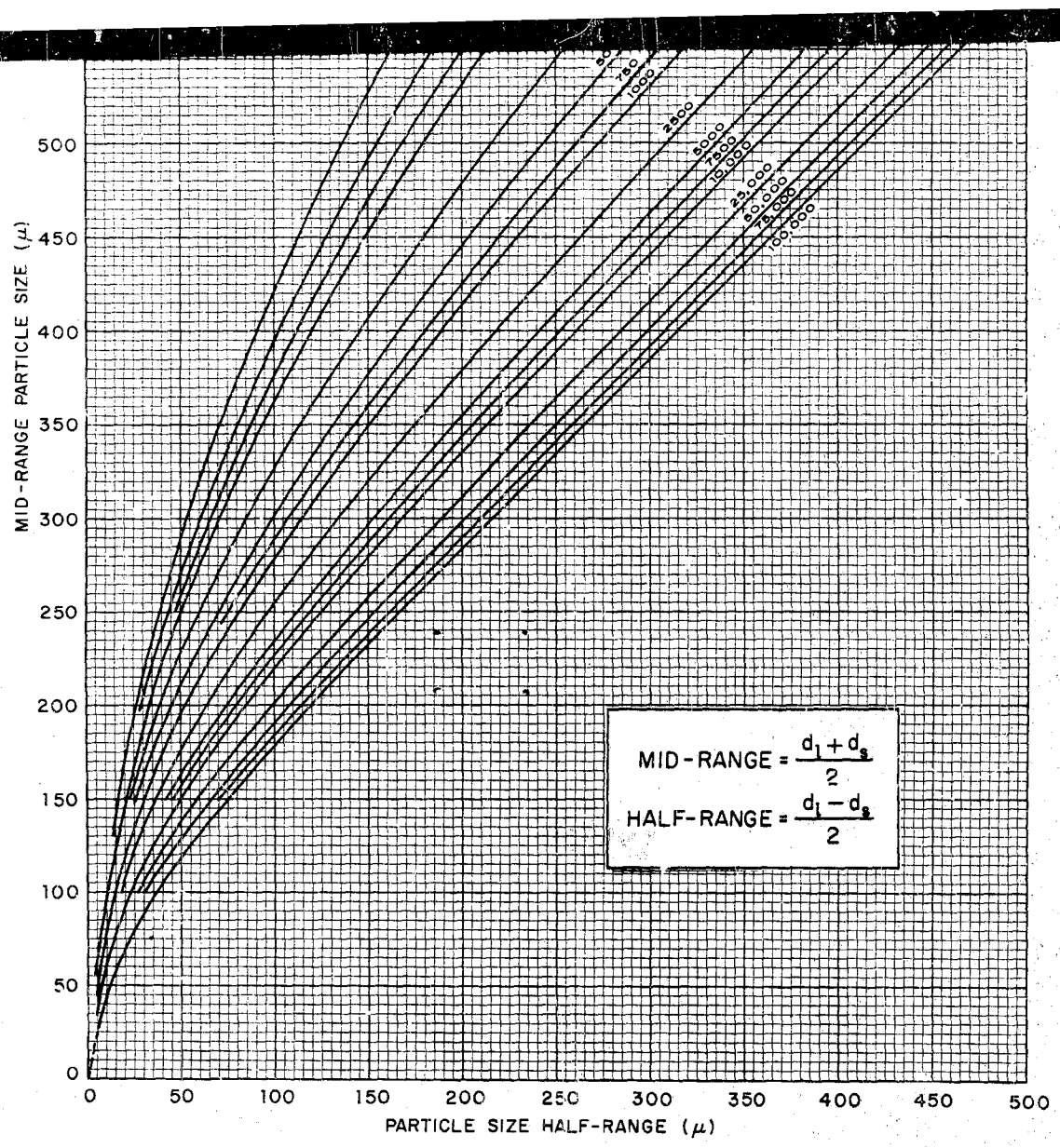
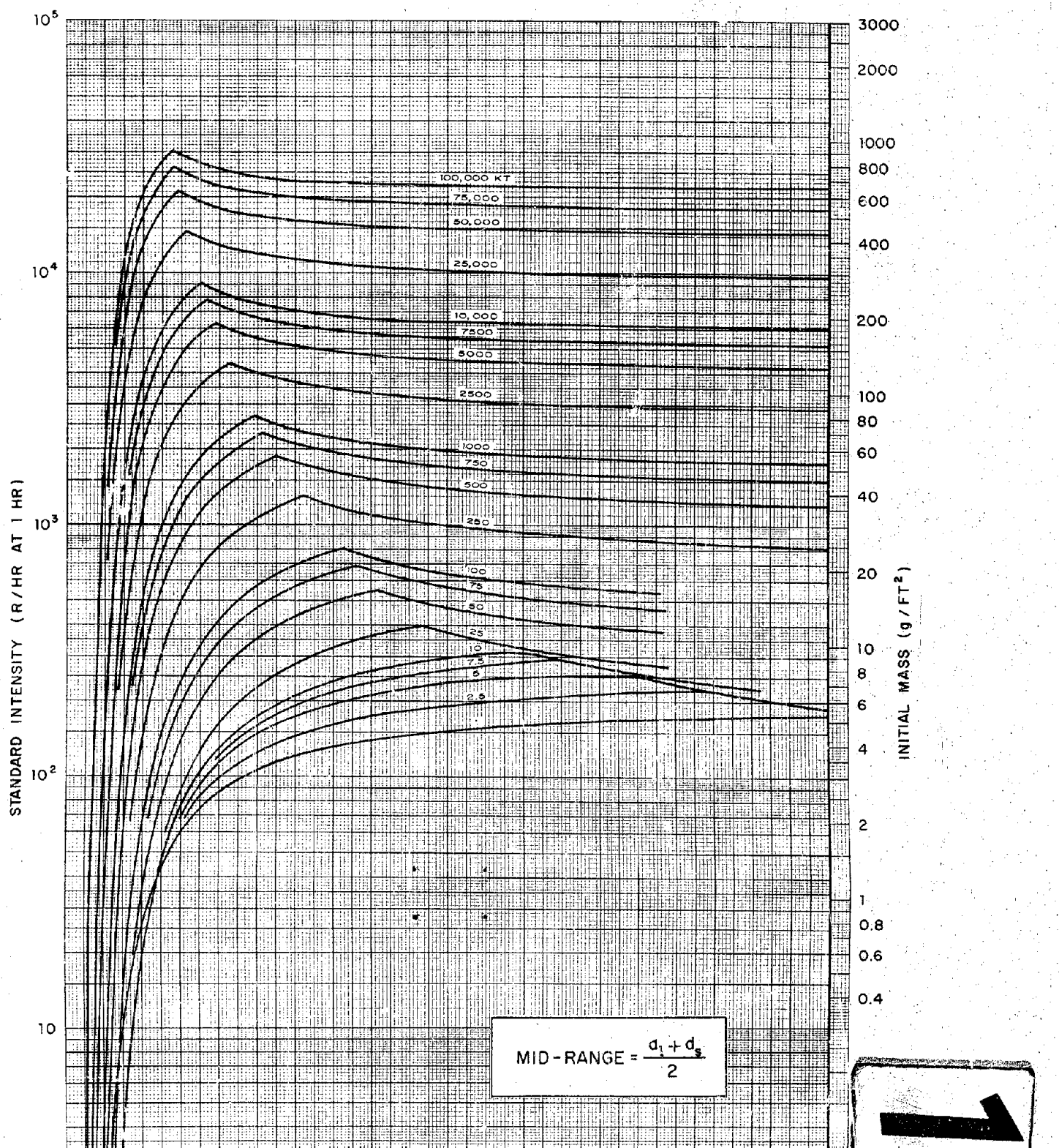


Fig. 2B Curves Used to Determine Weapon Yield Producing Fallout With Given Physical Properties Defined by Mid-Range Particle Size Half Range


STANDARD INTENSITY (R/HR AT 1 HR)
INITIAL MASS (g/FT²)
100,000 KT
75,000
50,000
25,000
10,000
7500
5000
2500
1000
750
500
250
100
75
50
25
10
7.5
5
2.5
MID-RANGE = $\frac{d_1 + d_s}{2}$

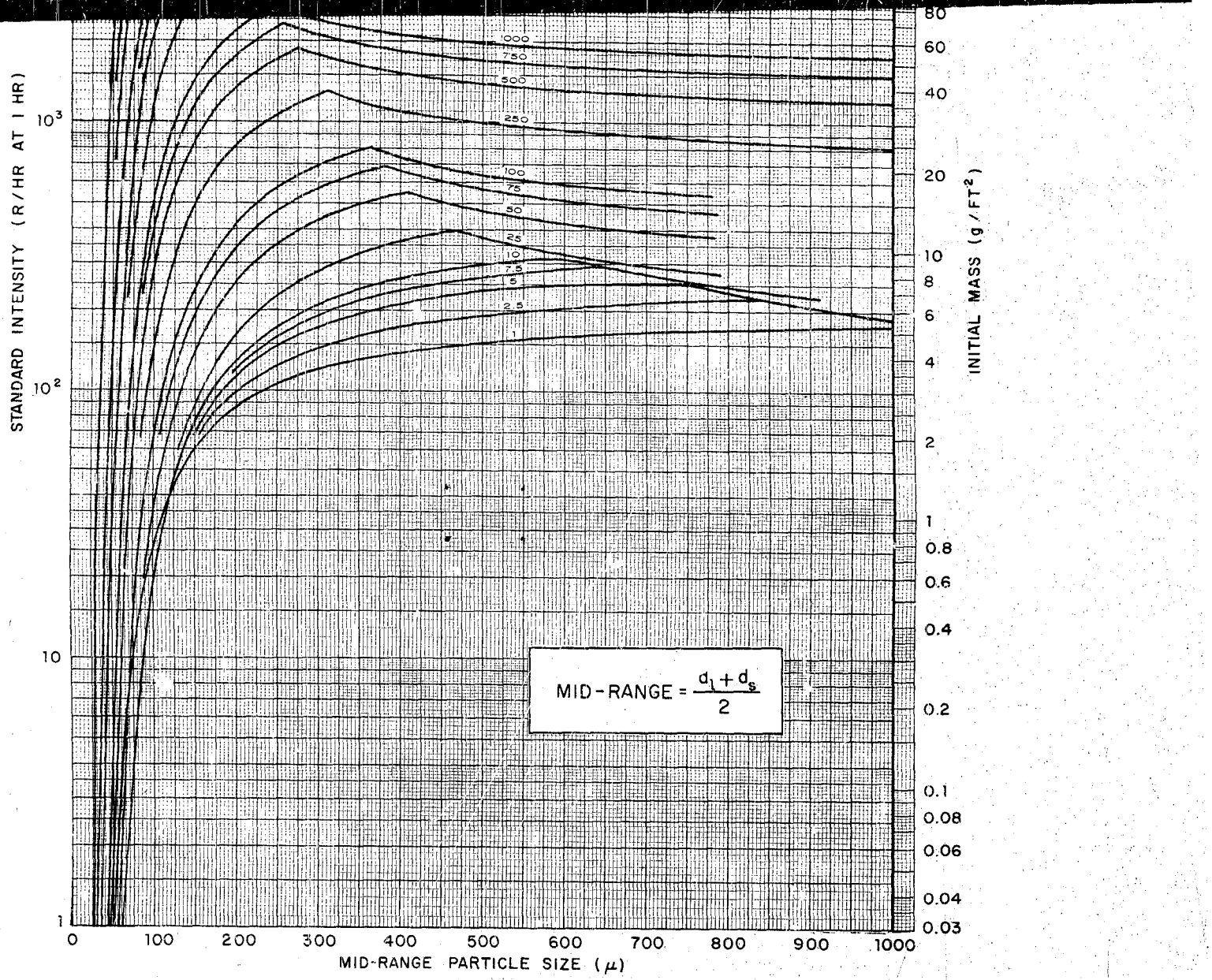


Fig. 3 Curves Used to Determine Standard Radiation Intensity and Deposited Mass Level for Given Mid-Range Particle Sizes and Weapon Yields

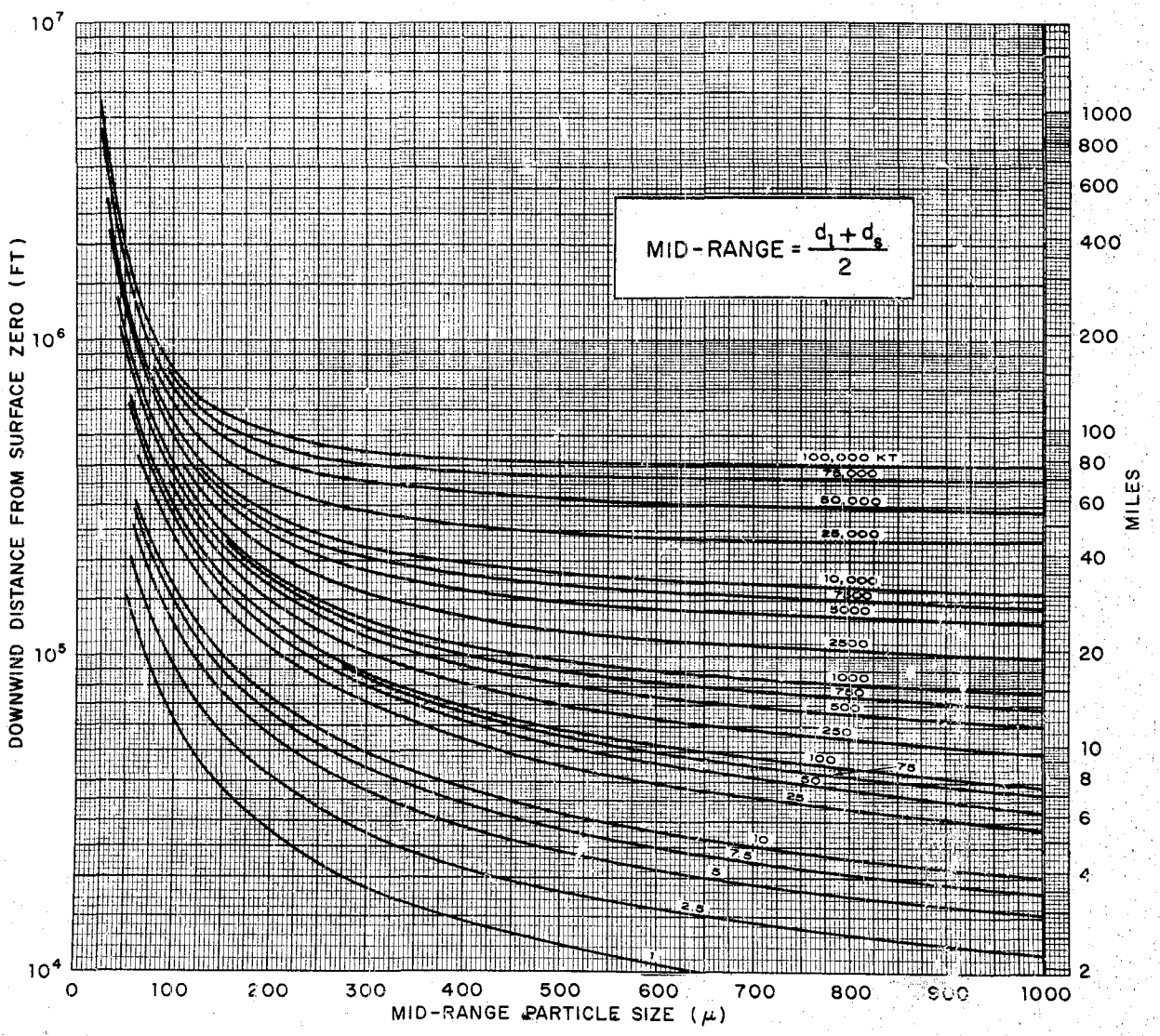


Fig. 4 Curves Used to Determine Downwind Distance From Surface Zero for Given Mid-range Particle Sizes and Weapon Yields

Reclamation experiments depend upon obtaining a suitable fallout simulant. Figures 2, 3 and 4 may be used to simulate a fallout environment using any commercially available raw material which has the physical and chemical properties of fallout. For convenience, the graphs have been oriented for the use of particle size as the independent variable to determine the remaining fallout environment properties of weapon yield, standard intensity, deposited mass and downwind distance. As a simplification in graphical representation, the fallout simulant size properties are defined by:

$$\text{mid-range size} = \frac{d_\ell + d_s}{2}$$

$$\text{size half-range} = \frac{d_\ell - d_s}{2}$$

where d_ℓ is the diameter (μ) of the largest particle in the simulant
d_s is the diameter (μ) of the smallest particle in the simulant.

This particle size range definition makes no allowance for a size distribution within the range, but the model predicts relatively narrow size ranges having a ratio of maximum-to-minimum-size between 2 and 10 with most of the predicted size ratios near 2 or 3.

Figures 2a and 2b are used to determine the weapon yield which produces fallout with particle sizes similar to the available synthetic fallout material. If, for example, the available material particle size range is 100 μ to 300 μ, the mid-size range is 200 μ and the size half-range is 100 μ. Figure 2b, gives the weapon yield corresponding to this mid-range size and size half-range as 25,000 KT.

Figure 3 shows standard intensity as a function of mid-range particle size for 21 specific yield values. The corresponding initial mass values from Eq. 12 are shown on the right-hand side. For the example given for a 25,000 KT weapon and a mid-range particle size of 200 μ, the standard intensity is 13,000 r/hr at 1 hr and the initial mass is 390 g/ft^2.

Figure 4 shows downwind distance from surface zero as a function of mid-range particle size for 21 specific yield values. For a 25,000 KT weapon and a mid-range particle size of 200 μ the downwind distance is 350,000 feet or 66.2 miles.

3.3 DISCUSSION

In the strictest interpretation of the fallout model for the example given, each particle size range corresponds to a unique combination of weapon yield, downwind distance, standard intensity and deposited initial mass. A broader interpretation of the model-predicted fallout environment recognizes that such a discrete set of conditions may not occur. Instead, particle size ranges narrower or wider than those predicted might be considered as offering essentially similar problems of radiological reclamation, since particle size is an important parameter relating to reclamation effectiveness. Figures 2a and 2b may be used for this broader interpretation by noting that the ordinate values are constant mid-range sizes, which can apply to any of the weapon yields plotted and which in turn can be used in Figures 3 and 4 to determine a range of standard intensities, initial masses and downwind distances for the various weapon yields.

This broader interpretation of the model can be applied to the example given by noting that the mid-range particle size of 200 μ in Figs. 2a and 2b applies to a maximum 80-320 μ range for 10^5 KT, through a minimum 175-225 μ range for 25 KT, to an intermediate 158-242 μ range for 1 KT. Following through on Figs. 3, 4 and 5, the expected range of fallout environment values are 1-10^5 KT, 86-26,000 r/hr at 1 hr, 2.6-780 g/ft^2 initial mass, and 28,000-515,000 ft downwind from surface zero, respectively. Sets of intermediate values can be determined from the Figures.

Figures 2a and 2b show the expected sizes of particles predicted by the model to be between 40 μ and 1000 μ. Figure 2a showing yields from 1 KT to 10 KT was used to clarify the overlap with 25, 50 and 75 KT curves due to the relationships between cloud geometries and the assumed wind speed of 15 mph. This overlap indicates that certain particle size ranges could be produced by two different weapon yields but would differ in standard intensity, initial mass, and downwind distances.

Figure 3 shows how the expected standard intensities and initial mass levels are related to particle size. The maximum values shown for each yield are the downwind peak intensities.

Figure 4 shows the expected downwind distances for various particle sizes. Over the range of weapon yields considered, the area of interest for reclamation appears to be from 1 to 400 miles downwind involving 40-1000 μ particles.

In addition to designing simulated reclamation experiments, data furnished by this fallout model could be used in actual reclamation planning. If a weapon yield and surface zero location were known or could be estimated, standard radiation intensities, deposited mass levels, and particle sizes could be estimated at known downwind distances using Figs. 3 and 4. This estimation of the fallout environment could be used to plan recovery entry times (using decay corrected radiation dose rates) and the recovery procedures to be used (based on results obtained with various methods using fallout simulants).

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APPENDIX A

PARTICLE AVERAGE TERMINAL VELOCITIES

A particle will reach a terminal velocity (i.e. when acceleration forces equal the drag forces) that is dependent upon its size, shape and density; the density and viscosity of the medium through which it falls; and the acceleration due to gravity. Research at NRDL[3,5] has evolved the following simplified formula for terminal velocities of irregular particles falling through a model atmosphere defined by the Air Research and Development Command:

$$V_h = \left[\frac{1.325\, b\eta}{\rho_o} \log_{10}^3 (bd + 1.163) \right] F_v \qquad \text{(A-1)}$$

where V_h = particle terminal velocity (cm sec^{-1})

$$b = \left[\frac{2g\, \rho_o\, (\rho - \rho_o)}{\eta^2} \right]^{1/3}$$

η = air coefficient of viscosity (g cm^{-1} sec^{-1})

ρ = particle density ($g \cdot cm^{-3}$)

ρ_o = air density (g cm^{-3})

g = acceleration of gravity (cm sec^{-2})

d = particle size (cm) defined as a cylinder of diameter d and length 2d.

$$F_v = 1 + \frac{L}{d} \left[2.514 + 0.800 \exp\left(-0.55 \frac{d}{L}\right) \right]$$

L = mean free path of air molecules (cm)

Equation A-1 is considered reliable for particle sizes where d is greater than 0.0020 cm (20 μ) and was used to compute the terminal velocity of a given particle sized through a 10,000 ft increment of altitude at mid-height h above sea level. The time required for the particle to fall through the 10,000 foot altitude increment is:

$$t_i = \frac{10{,}000}{V_h} \qquad \text{(A-2)}$$

The total time required for the particle to fall to sea level from any initial altitude h is the sum of the times of fall through each altitude increment:

$$T = \Sigma t_i \qquad (A\text{-}3)$$

The average terminal velocity is therefore the initial altitude divided by the total time:

$$v_f = \frac{h}{T} \qquad (A\text{-}4)$$

Table A-1 shows v_f values for particle initial altitudes from sea level to 180,000 feet for a series of particle sizes d of 20 μ to 10,000 μ. v_f values for intermediate altitudes and particle sizes can be obtained by interpolation. In the present application to the fallout model, Table A.1 was used to interpolate for the particle size corresponding to a given initial altitude and average terminal velocity vector v_f.

Table A.1

Average Terminal Velocities for Irregular Particles From a Given Initial Altitude to Sea Level Where

Mu is the particle size in microns
Alt is the initial altitude of the particle size Mu in feet above sea level
VF is the average terminal velocity in feet per second for Mu from alt to 0.0 feet mean sea level

	MU 10000.0	MU 7207.0	MU 5049.5	MU 3999.2	MU 3344.7
ALT	VF	VF	VF	VF	VF
10000.	83.9400	71.6063	59.6591	52.6057	47.5988
20000.	90.5892	77.2181	64.2739	56.6363	51.2171
30000.	97.8698	83.3601	69.3217	61.0433	55.1720
40000.	105.9913	90.2051	74.9241	65.9451	59.5677
50000.	115.2611	98.0001	81.3217	71.4990	64.5393
60000.	125.4657	106.5661	88.3178	77.5782	69.9732
70000.	136.3474	115.6902	95.7588	84.0369	75.7407
80000.	147.8590	125.3328	103.6126	90.8470	81.8167
90000.	159.9061	135.4148	111.8142	97.9518	88.1504
100000.	172.3805	145.8469	120.2921	105.2902	94.6876
110000.	185.1842	156.5483	128.9820	112.8071	101.3798
120000.	198.2896	167.4955	137.8640	120.4848	108.2112
130000.	211.6258	178.6304	146.8926	128.2853	115.1484
140000.	225.1432	189.9130	156.0367	136.1824	122.1692
150000.	238.8062	201.3145	165.2741	144.1580	129.2580
160000.	252.6010	212.8244	174.5977	152.2070	136.4114
170000.	266.5028	224.4243	183.9954	160.3210	143.6237
180000.	280.5104	236.1171	193.4742	168.5100	150.9068

	MU 2888.0	MU 2547.9	MU 2262.5	MU 2067.6	MU 1890.4
ALT	VF	VF	VF	VF	VF
10000.	43.7359	40.6113	37.9973	35.7476	33.7887
20000.	47.0377	43.6582	40.8318	38.4001	36.2832
30000.	50.6455	46.9867	43.9275	41.2962	39.0063
40000.	54.6531	50.6818	47.3624	44.5082	42.0249
50000.	59.1783	54.8481	51.2300	48.1200	45.4151
60000.	64.1179	59.3904	55.4420	52.0493	49.0995
70000.	69.3562	64.2036	59.9018	56.2067	52.9951
80000.	74.8704	69.2666	64.5898	60.5741	57.0848
90000.	80.6140	74.5365	69.4660	65.1137	61.3332
100000.	86.5382	79.9687	74.4895	69.7877	65.7048
110000.	92.5996	85.5237	79.6239	74.5626	70.1686
120000.	98.7835	91.1879	84.8565	79.4263	74.7133
130000.	105.0604	96.9350	90.1637	84.3575	79.3193
140000.	111.4110	102.7478	95.5299	89.3422	83.9741
150000.	117.8217	108.6145	100.9450	94.3714	88.6697
160000.	124.2904	114.5340	106.4085	99.4456	93.4074
170000.	130.8135	120.5044	111.9203	104.5658	98.1892
180000.	137.4045	126.5405	117.4962	109.7487	103.0326

Table A.1 cont'd.

	MU 1741.8	MU 1614.3	MU 1503.8	MU 1406.0	MU 1321.6
ALT	VF	VF	VF	VF	VF
10000.	32.0638	30.5175	29.1224	27.8805	26.6946
20000.	34.4196	32.7495	31.2430	29.8698	28.6222
30000.	36.9908	35.1851	33.5565	32.0724	30.7243
40000.	39.8398	37.8826	36.1179	34.5100	33.0499
50000.	43.0357	40.9051	38.9846	37.2352	35.6471
60000.	46.5056	44.1835	42.0912	40.1858	38.4566
70000.	50.1719	47.6454	45.3695	43.2976	41.4177
80000.	54.0188	51.2754	48.8049	46.5566	44.5173
90000.	58.0119	55.0415	52.3671	49.9339	47.7274
100000.	62.1190	58.9127	56.0268	53.4018	51.0219
110000.	66.3106	62.8618	59.7583	56.9341	54.3780
120000.	70.5761	66.8786	63.5521	60.5277	57.7871
130000.	74.8976	70.9467	67.3931	64.1628	61.2363
140000.	79.2639	75.0560	71.2720	67.8331	64.7181
150000.	83.6678	79.2002	75.1834	71.5336	68.2283
160000.	88.1112	83.3818	79.1303	75.2681	71.7710
170000.	92.5972	87.6046	83.1173	79.0416	75.3520
180000.	97.1441	91.8875	87.1640	82.8745	78.9919

	MU 1244.8	MU 1175.4	MU 1113.6	MU 1057.7	MU 1006.4
ALT	VF	VF	VF	VF	VF
10000.	25.6176	24.6142	23.6949	22.8415	22.0366
20000.	27.4599	26.3773	25.3857	24.4652	23.5973
30000.	29.4687	28.2994	27.2286	26.2349	25.2980
40000.	31.6902	30.4242	29.2652	28.1898	27.1760
50000.	34.1685	32.7922	31.5325	30.3640	29.2628
60000.	36.8471	35.3494	33.9789	32.7079	31.5105
70000.	39.6686	38.0413	36.5526	35.1725	33.8725
80000.	42.6202	40.8558	39.2422	37.7465	36.3381
90000.	45.6754	43.7674	42.0229	40.4063	38.8844
100000.	48.8093	46.7525	44.8723	43.1304	41.4910
110000.	52.0003	49.7905	47.7709	45.9004	44.1402
120000.	55.2402	52.8737	50.7114	48.7091	46.8254
130000.	58.5172	55.9912	53.6837	51.5474	49.5380
140000.	61.8246	59.1370	56.6824	54.4104	52.2739
150000.	65.1585	62.3079	59.7048	57.2959	55.0310
160000.	68.5237	65.5088	62.7563	60.2096	57.8156
170000.	71.9265	68.7468	65.8443	63.1593	60.6358
180000.	75.3880	72.0432	68.9906	66.1672	63.5141

Table A.1 cont'd.

	MU 959.1	MU 915.6	MU 874.9	MU 837.3	MU 802.8
ALT	VF	VF	VF	VF	VF
10000.	21.2779	20.5632	19.8782	19.2333	18.6276
20000.	22.7793	22.0090	21.2708	20.5760	19.9235
30000.	24.4152	23.5840	22.7877	22.0381	21.3345
40000.	26.2211	25.3221	24.4609	23.6506	22.8900
50000.	28.2256	27.2494	26.3146	25.4352	24.6099
60000.	30.3830	29.3221	28.3064	27.3511	26.4549
70000.	32.6488	31.4977	30.3958	29.3598	28.3880
80000.	35.0127	33.7661	32.5733	31.4520	30.4005
90000.	37.4526	36.1063	34.8184	33.6079	32.4731
100000.	39.9490	38.4994	37.1130	35.8103	34.5893
110000.	42.4850	40.9293	39.4418	38.0445	36.7351
120000.	45.0543	43.3902	41.7994	40.3052	38.9055
130000.	47.6492	45.8749	44.1790	42.5865	41.0950
140000.	50.2659	48.3800	46.5778	44.8860	43.3017
150000.	52.9028	50.9044	48.9952	47.2032	45.5255
160000.	55.5665	53.4551	51.4382	49.5456	47.7741
170000.	58.2656	56.0407	53.9160	51.9226	50.0570
180000.	61.0226	58.6844	56.4518	54.3575	52.3979

	MU 770.2	MU 740.3	MU 712.1	MU 685.6	MU 660.6
ALT	VF	VF	VF	VF	VF
10000.	18.0469	17.5019	16.9800	16.4799	16.0013
20000.	19.2980	18.7111	18.1492	17.6108	17.0957
30000.	20.6600	20.0273	19.4217	18.8415	18.2865
40000.	22.1611	21.4774	20.8231	20.1965	19.5971
50000.	23.8192	23.0777	22.3683	21.6890	21.0393
60000.	25.5964	24.7917	24.0218	23.2848	22.5801
70000.	27.4575	26.5854	25.7513	24.9530	24.1899
80000.	29.3939	28.4507	27.5489	26.6860	25.8614
90000.	31.3871	30.3696	29.3970	28.4667	27.5778
100000.	33.4210	32.3269	31.2811	30.2811	29.3259
110000.	35.4825	34.3096	33.1889	32.1175	31.0943
120000.	37.5668	36.3135	35.1163	33.9719	32.8793
130000.	39.6688	38.3340	37.0592	35.8409	34.6779
140000.	41.7872	40.3679	39.0167	37.7238	36.4898
150000.	43.9220	42.4218	40.9896	39.6216	38.3163
160000.	46.0811	44.4977	42.9863	41.5430	40.1660
170000.	48.2776	46.6077	45.0171	43.4984	42.0499
180000.	50.5260	48.7758	47.1059	45.5118	43.9916

Table A.1 cont'd.

	MU 637.1	MU 614.9	MU 594.0	MU 574.3	MU 556.8
ALT	VF	VF	VF	VF	VF
10000.	15.5428	15.1043	14.6846	14.2832	13.8993
20000.	16.6024	16.1305	15.6790	15.2473	14.8345
30000.	17.7550	17.2468	16.7605	16.2958	15.8513
40000.	19.0233	18.4746	17.9498	17.4482	16.9687
50000.	20.4176	19.8232	19.2547	18.7116	18.1925
60000.	21.9059	21.2616	20.6455	20.0570	19.4946
70000.	23.4600	22.7627	22.0960	21.4594	20.8511
80000.	25.0728	24.3195	23.5995	22.9122	22.2557
90000.	26.7280	25.9165	25.1410	24.4009	23.6942
100000.	28.4129	27.5411	26.7084	25.9138	25.1552
110000.	30.1165	29.1831	28.2917	27.4414	26.6297
120000.	31.8355	30.8393	29.8881	28.9810	28.1153
130000.	33.5671	32.5073	31.4956	30.5310	29.6106
140000.	35.3115	34.1875	33.1148	32.0922	31.1168
150000.	37.0700	35.8816	34.7476	33.6668	32.6361
160000.	38.8518	37.5987	36.4032	35.2641	34.1781
170000.	40.6675	39.3498	38.0930	36.8956	35.7543
180000.	42.5411	41.1587	39.8404	38.5846	37.3879

	MU 537.8	MU 520.4	MU 504.4	MU 489.3	MU 474.7
ALT	VF	VF	VF	VF	VF
10000.	13.5231	13.1539	12.8103	12.4823	12.1604
20000.	14.4300	14.0331	13.6638	13.3114	12.9655
30000.	15.4160	14.9888	14.5915	14.2123	13.8402
40000.	16.4990	16.0384	15.6099	15.2011	14.8000
50000.	17.6841	17.1856	16.7220	16.2799	15.8461
60000.	18.9441	18.4043	17.9025	17.4239	16.9547
70000.	20.2558	19.6723	19.1300	18.6129	18.1060
80000.	21.6133	20.9838	20.3989	19.8414	19.2949
90000.	23.0028	22.3254	21.6962	21.0964	20.5090
100000.	24.4132	23.6866	23.0117	22.3687	21.7389
110000.	25.8361	25.0590	24.3374	23.6502	22.9771
120000.	27.2690	26.4406	25.6716	24.9393	24.2223
130000.	28.7112	27.8309	27.0139	26.2362	25.4748
140000.	30.1638	29.2312	28.3660	27.5425	26.7366
150000.	31.6293	30.6444	29.7307	28.8614	28.0108
160000.	33.1175	32.0802	31.1181	30.2030	29.3077
170000.	34.6399	33.5502	32.5398	31.5788	30.6390
180000.	36.2196	35.0774	34.0185	33.0116	32.0269

Table A.1 cont'd.

	MU 460.5	MU 446.7	MU 433.7	MU 421.5	MU 409.5
ALT	VF	VF	VF	VF	VF
10000.	11.8445	11.5344	11.2385	10.9564	10.6795
20000.	12.6260	12.2931	11.9753	11.6724	11.3751
30000.	13.4752	13.1172	12.7755	12.4500	12.1305
40000.	14.4066	14.0208	13.6527	13.3020	12.9579
50000.	15.4208	15.0037	14.6060	14.2271	13.8554
60000.	16.4946	16.0435	15.6135	15.2040	14.8023
70000.	17.6091	17.1222	16.6580	16.2160	15.7827
80000.	18.7594	18.2348	17.7348	17.2589	16.7923
90000.	19.9334	19.3696	18.8324	18.3212	17.8202
100000.	21.1219	20.5178	19.9424	19.3949	18.8586
110000.	22.3180	21.6727	21.0583	20.4739	19.9014
120000.	23.5204	22.8334	22.1794	21.5575	20.9485
130000.	24.7297	24.0005	23.3066	22.6469	22.0011
140000.	25.9480	25.1766	24.4426	23.7450	23.0622
150000.	27.1787	26.3649	25.5907	24.8552	24.1355
160000.	28.4321	27.5760	26.7618	25.9884	25.2317
170000.	29.7200	28.8216	27.9574	27.1562	26.3627
180000.	31.0642	30.1233	29.2288	28.3795	27.5489

	MU 398.3	MU 387.4	MU 376.7	MU 366.7	MU 357.0
ALT	VF	VF	VF	VF	VF
10000.	10.4154	10.1564	9.9017	9.6594	9.4214
20000.	11.0917	10.8136	10.5405	10.2805	10.0252
30000.	11.8259	11.5272	11.2338	10.9545	10.6804
40000.	12.6300	12.3084	11.9925	11.6920	11.3971
50000.	13.5012	13.1540	12.8130	12.4887	12.1704
60000.	14.4197	14.0446	13.6764	13.3263	12.9828
70000.	15.3700	14.9656	14.5687	14.1914	13.8213
80000.	16.3482	15.9130	15.4860	15.0803	14.6823
90000.	17.3434	16.8764	16.4183	15.9830	15.5563
100000.	18.3482	17.8485	17.3584	16.8929	16.4366
110000.	19.3569	18.8238	18.3012	17.8049	17.3186
120000.	20.3693	19.8025	19.2470	18.7195	18.2029
130000.	21.3871	20.7863	20.1976	19.6389	19.0917
140000.	22.4132	21.7784	21.1565	20.5664	19.9887
150000.	23.4515	22.7827	22.1276	21.5062	20.8981
160000.	24.5129	23.8101	23.1220	22.4694	21.8309
170000.	25.6091	24.8724	24.1512	23.4675	22.7985
180000.	26.7600	25.9891	25.2345	24.5192	23.8194

Table A.1 cont'd.

	MU 347.7	MU 338.8	MU 330.0	MU 321.8	MU 313.7
ALT	VF	VF	VF	VF	VF
10000.	9.1948	8.9724	8.7537	8.5459	8.3418
20000.	9.7822	9.5437	9.3093	9.0866	8.8678
30000.	10.4195	10.1635	9.9120	9.6730	9.4383
40000.	11.1164	10.8411	10.5705	10.3136	10.0612
50000.	11.8677	11.5707	11.2790	11.0020	10.7301
60000.	12.6562	12.3359	12.0213	11.7226	11.4295
70000.	13.4695	13.1245	12.7858	12.4644	12.1490
80000.	14.3041	13.9334	13.5696	13.2243	12.8856
90000.	15.1508	14.7535	14.3656	13.9938	13.6311
100000.	16.0032	15.5786	15.1621	14.7671	14.3799
110000.	16.8568	16.4045	15.9610	15.5405	15.1283
120000.	17.7124	17.2321	16.7613	16.3150	15.8777
130000.	18.5724	18.0640	17.5658	17.0937	16.6313
140000.	19.4405	18.9041	18.3785	17.8807	17.3930
150000.	20.3211	19.7567	19.2038	18.6802	18.1675
160000.	21.2252	20.6329	20.0528	19.5036	18.9660
170000.	22.1642	21.5440	20.9366	20.3618	19.7992
180000.	23.1560	22.5074	21.8723	21.2713	20.6832

	MU 305.9	MU 298.3	MU 290.8	MU 283.8	MU 276.9
ALT	VF	VF	VF	VF	VF
10000.	8.1412	7.9442	7.7507	7.5669	7.3865
20000.	8.6529	8.4418	8.2346	8.0377	7.8446
30000.	9.2077	8.9814	8.7592	8.5481	8.3411
40000.	9.8135	9.5702	9.3315	9.1048	8.8824
50000.	10.4631	10.2011	9.9439	9.6998	9.4604
60000.	11.1418	10.8595	10.5825	10.3197	10.0620
70000.	11.8395	11.5359	11.2381	10.9556	10.6787
80000.	12.5534	12.2276	11.9082	11.6052	11.3083
90000.	13.2754	12.9267	12.5849	12.2608	11.9433
100000.	14.0003	13.6282	13.2635	12.9179	12.5794
110000.	14.7243	14.3285	13.9408	13.5734	13.2136
120000.	15.4493	15.0296	14.6186	14.2293	13.8481
130000.	16.1783	15.7347	15.3004	14.8891	14.4867
140000.	16.9156	16.4482	15.9906	15.5575	15.1338
150000.	17.6656	17.1745	16.6938	16.2390	15.7941
160000.	18.4399	17.9250	17.4214	16.9449	16.4789
170000.	19.2487	18.7101	18.1834	17.6851	17.1980
180000.	20.1078	19.5450	18.9946	18.4739	17.9659

Table A.1 cont'd.

	MU 270.2	MU 263.9	MU 257.8	MU 251.8	MU 245.9
ALT	VF	VF	VF	VF	VF
10000.	7.2091	7.0409	6.8756	6.7132	6.5537
20000.	7.6547	7.4747	7.2978	7.1241	6.9534
30000.	8.1376	7.9447	7.7552	7.5691	7.3864
40000.	8.6639	8.4568	8.2534	8.0537	7.8576
50000.	9.2252	9.0024	8.7836	8.5689	8.3580
60000.	9.8089	9.5692	9.3339	9.1029	8.8763
70000.	10.4068	10.1494	9.8967	9.6488	9.4057
80000.	11.0168	10.7410	10.4703	10.2048	9.9444
90000.	11.6318	11.3369	11.0477	10.7642	10.4862
100000.	12.2473	11.9332	11.6251	11.3232	11.0272
110000.	12.8608	12.5271	12.2000	11.8795	11.5654
120000.	13.4745	13.1212	12.7751	12.4360	12.1038
130000.	14.0922	13.7194	13.3542	12.9965	12.6463
140000.	14.7186	14.3283	13.9422	13.5660	13.1978
150000.	15.3583	14.9467	14.5436	14.1492	13.7631
160000.	16.0226	15.5917	15.1699	14.7572	14.3523
170000.	16.7210	16.2707	15.8300	15.3988	14.9770
180000.	17.4668	16.9964	16.5362	16.0859	15.6454

	MU 240.2	MU 234.5	MU 229.1	MU 223.9	MU 218.9
ALT	VF	VF	VF	VF	VF
10000.	6.3970	6.2432	6.0921	5.9489	5.8084
20000.	6.7858	6.6213	6.4597	6.3067	6.1565
30000.	7.2069	7.0308	6.8578	6.6941	6.5334
40000.	7.6651	7.4762	7.2908	7.1152	6.9430
50000.	8.1511	7.9481	7.7488	7.5603	7.3753
60000.	8.6539	8.4357	8.2218	8.0192	7.8207
70000.	9.1671	8.9332	8.7038	8.4867	8.2740
80000.	9.6891	9.4388	9.1934	8.9613	8.7339
90000.	10.2136	9.9465	9.6847	9.4372	9.1948
100000.	10.7372	10.4530	10.1746	9.9114	9.6538
110000.	11.2578	10.9564	10.6613	10.3824	10.1094
120000.	11.7784	11.4599	11.1480	10.8535	10.5652
130000.	12.3034	11.9677	11.6392	11.3290	11.0255
140000.	12.8374	12.4848	12.1397	11.8140	11.4955
150000.	13.3854	13.0158	12.6544	12.3133	11.9798
160000.	13.9583	13.5719	13.1941	12.8377	12.4892
170000.	14.5644	14.1610	13.7665	13.3945	13.0308
180000.	15.2147	14.7935	14.3817	13.9933	13.6138

Table A.1 cont'd.

	MU 214.0	MU 209.1	MU 204.4	MU 200.0	MU 195.7
ALT	VF	VF	VF	VF	VF
10000.	5.6702	5.5347	5.4015	5.2754	5.1519
20000.	6.0089	5.8641	5.7219	5.5874	5.4553
30000.	6.3755	6.2207	6.0685	5.9247	5.7836
40000.	6.7737	6.6078	6.4448	6.2909	6.1397
50000.	7.1936	7.0155	6.8407	6.6755	6.5133
60000.	7.6257	7.4347	7.2471	7.0700	6.8962
70000.	8.0652	7.8606	7.6598	7.4702	7.2843
80000.	8.5107	8.2921	8.0777	7.8752	7.6768
90000.	8.9569	8.7240	8.4956	8.2802	8.0690
100000.	9.4011	9.1537	8.9112	8.6825	8.4584
110000.	9.8418	9.5799	9.3233	9.0813	8.8443
120000.	10.2827	10.0063	9.7356	9.4804	9.2308
130000.	10.7282	10.4375	10.1528	9.8845	9.6219
140000.	11.1835	10.8786	10.5800	10.2988	10.0236
150000.	11.6533	11.3342	11.0219	10.7278	10.4401
160000.	12.1482	11.8149	11.4888	11.1818	10.8815
170000.	12.6749	12.3272	11.9870	11.6669	11.3637
180000.	13.2424	12.8795	12.5245	12.1904	11.8637

	MU 191.3	MU 186.9	MU 182.9	MU 178.9	MU 175.0
ALT	VF	VF	VF	VF	VF
10000.	5.0258	4.9020	4.7850	4.6702	4.5574
20000.	5.3207	5.1886	5.0638	4.9412	4.8209
30000.	5.6398	5.4985	5.3652	5.2343	5.1059
40000.	5.9857	5.8346	5.6919	5.5518	5.4144
50000.	6.3482	6.1862	6.0333	5.8833	5.7361
60000.	6.7193	6.5457	6.3819	6.2213	6.0638
70000.	7.0951	6.9095	6.7345	6.5629	6.3947
80000.	7.4749	7.2770	7.0903	6.9074	6.7282
90000.	7.8541	7.6436	7.4452	7.2507	7.0603
100000.	8.2305	8.0073	7.7970	7.5909	7.3892
110000.	8.6034	8.3674	8.1452	7.9276	7.7146
120000.	8.9767	8.7282	8.4941	8.2651	8.0410
130000.	9.3552	9.0942	8.8485	8.6081	8.3730
140000.	9.7442	9.4708	9.2135	8.9619	8.7159
150000.	10.1480	9.8624	9.5937	9.3309	9.0741
160000.	10.5768	10.2789	9.9986	9.7246	9.4568
170000.	11.0359	10.7253	10.4331	10.1475	9.8684
180000.	11.5321	11.2080	10.9032	10.6063	10.3148

Table A.1 cont'd.

	MU 171.3	MU 167.7	MU 164.2	MU 160.6	MU 157.1
ALT	VF	VF	VF	VF	VF
10000.	4.4468	4.3423	4.2397	4.1350	4.0323
20000.	4.7029	4.5915	4.4822	4.3706	4.2612
30000.	4.9799	4.8609	4.7443	4.6252	4.5085
40000.	5.2797	5.1525	5.0278	4.9006	4.7758
50000.	5.5918	5.4557	5.3222	5.1861	5.0526
60000.	5.9094	5.7638	5.6211	5.4756	5.3330
70000.	6.2298	6.0744	5.9221	5.7669	5.6148
80000.	6.5526	6.3871	6.2250	6.0597	5.8980
90000.	6.8738	6.6980	6.5260	6.3507	6.1791
100000.	7.1917	7.0057	6.8237	6.6383	6.4569
110000.	7.5062	7.3100	7.1180	6.9225	6.7314
120000.	7.8217	7.6154	7.4136	7.2082	7.0074
130000.	8.1431	7.9267	7.7152	7.5000	7.2897
140000.	8.4754	8.2492	8.0281	7.8032	7.5838
150000.	8.8231	8.5870	8.3564	8.1219	7.8928
160000.	9.1952	8.9492	8.7089	8.4645	8.2260
170000.	9.5957	9.3394	9.0890	8.8345	8.5859
180000.	10.0297	9.7624	9.5012	9.2357	8.9765

	MU 153.7	MU 150.5	MU 147.4	MU 144.2	MU 141.2
ALT	VF	VF	VF	VF	VF
10000.	3.9316	3.8365	3.7433	3.6482	3.5585
20000.	4.1538	4.0526	3.9533	3.8521	3.7566
30000.	4.3940	4.2860	4.1802	4.0723	3.9705
40000.	4.6535	4.5382	4.4252	4.3100	4.2014
50000.	4.9219	4.7986	4.6779	4.5547	4.4387
60000.	5.1933	5.0616	4.9327	4.8013	4.6776
70000.	5.4659	5.3256	5.1883	5.0484	4.9166
80000.	5.7397	5.5905	5.4446	5.2960	5.1561
90000.	6.0112	5.8532	5.6985	5.5412	5.3930
100000.	6.2795	6.1125	5.9492	5.7830	5.6267
110000.	6.5445	6.3687	6.1968	6.0220	5.8576
120000.	6.8111	6.6266	6.4463	6.2629	6.0905
130000.	7.0843	6.8911	6.7025	6.5107	6.3305
140000.	7.3690	7.1673	6.9704	6.7703	6.5824
150000.	7.6692	7.4591	7.2539	7.0456	6.8498
160000.	7.9931	7.7743	7.5607	7.3438	7.1401
170000.	8.3433	8.1154	7.8930	7.6671	7.4550
180000.	8.7234	8.4858	8.2538	8.0182	7.7949

Table A.1 cont'd.

	MU 138.2	MU 135.2	MU 132.4	MU 129.7	MU 127.0
ALT	VF	VF	VF	VF	VF
10000.	3.4706	3.3809	3.2964	3.2135	3.1323
20000.	3.6630	3.5676	3.4777	3.3896	3.3032
30000.	3.8708	3.7692	3.6734	3.5796	3.4876
40000.	4.0950	3.9866	3.8844	3.7844	3.6863
50000.	4.3251	4.2094	4.1004	3.9937	3.8891
60000.	4.5564	4.4330	4.3168	4.2031	4.0918
70000.	4.7877	4.6564	4.5329	4.4120	4.2937
80000.	5.0192	4.8799	4.7489	4.6208	4.4953
90000.	5.2482	5.1009	4.9623	4.8269	4.6943
100000.	5.4740	5.3186	5.1726	5.0299	4.8903
110000.	5.6970	5.5337	5.3803	5.2304	5.0839
120000.	5.9222	5.7512	5.5905	5.4337	5.2803
130000.	6.1546	5.9759	5.8081	5.6444	5.4844
140000.	6.3990	6.2127	6.0379	5.8673	5.7007
150000.	6.6589	6.4650	6.2831	6.1056	5.9323
160000.	6.9414	6.7397	6.5504	6.3658	6.1856
170000.	7.2481	7.0380	6.8409	6.6487	6.4611
180000.	7.5811	7.3621	7.1565	6.9560	6.7603

	MU 124.3	MU 121.7	MU 119.2	MU 116.7	MU 114.3
ALT	VF	VF	VF	VF	VF
10000.	3.0527	2.9747	2.8982	2.8233	2.7500
20000.	3.2186	3.1356	3.0544	2.9748	2.8970
30000.	3.3976	3.3093	3.2230	3.1383	3.0565
40000.	3.5904	3.4963	3.4043	3.3142	3.2260
50000.	3.7868	3.6865	3.5885	3.4925	3.3986
60000.	3.9828	3.8761	3.7718	3.6697	3.5699
70000.	4.1780	4.0647	3.9540	3.8456	3.7397
80000.	4.3728	4.2528	4.1356	4.0209	3.9089
90000.	4.5649	4.4382	4.3145	4.1935	4.0754
100000.	4.7540	4.6207	4.4906	4.3634	4.2393
110000.	4.9409	4.8011	4.6647	4.5314	4.4014
120000.	5.1307	4.9846	4.8420	4.7027	4.5669
130000.	5.3283	5.1759	5.0273	4.8821	4.7407
140000.	5.5382	5.3795	5.2249	5.0739	4.9268
150000.	5.7634	5.5984	5.4377	5.2808	5.1279
160000.	6.0098	5.8383	5.6712	5.5080	5.3491
170000.	6.2781	6.0995	5.9255	5.7557	5.5902
180000.	6.5695	6.3832	6.2016	6.0245	5.8519

Table A.1 cont'd.

	MU 111.8	MU 109.4	MU 107.2	MU 104.9	MU 102.7
ALT	VF	VF	VF	VF	VF
10000.	2.6753	2.6050	2.5362	2.4688	2.4029
20000.	2.8177	2.7430	2.6700	2.5985	2.5286
30000.	2.9712	2.8919	2.8143	2.7383	2.6641
40000.	3.1362	3.0518	2.9693	2.8885	2.8095
50000.	3.3030	3.2132	3.1254	3.0394	2.9555
60000.	3.4683	3.3729	3.2796	3.1884	3.0993
70000.	3.6321	3.5309	3.4322	3.3356	3.2412
80000.	3.7951	3.6882	3.5838	3.4818	3.3822
90000.	3.9555	3.8428	3.7329	3.6255	3.5207
100000.	4.1132	3.9949	3.8795	3.7669	3.6570
110000.	4.2694	4.1456	4.0249	3.9070	3.7922
120000.	4.4292	4.3000	4.1740	4.0512	3.9315
130000.	4.5972	4.4627	4.3316	4.2038	4.0793
140000.	4.7776	4.6378	4.5017	4.3689	4.2396
150000.	4.9730	4.8277	4.6863	4.5485	4.4142
160000.	5.1880	5.0371	4.8901	4.7468	4.6073
170000.	5.4225	5.2654	5.1123	4.9631	4.8179
180000.	5.6769	5.5130	5.3533	5.1976	5.0461

	MU 100.6	MU 98.5	MU 96.4	MU 94.4	MU 92.4
ALT	VF	VF	VF	VF	VF
10000.	2.3384	2.2753	2.2135	2.1531	2.0917
20000.	2.4601	2.3932	2.3277	2.2637	2.1986
30000.	2.5914	2.5204	2.4508	2.3829	2.3139
40000.	2.7322	2.6567	2.5828	2.5107	2.4374
50000.	2.8733	2.7931	2.7147	2.6381	2.5603
60000.	3.0122	2.9271	2.8440	2.7628	2.6804
70000.	3.1491	3.0591	2.9712	2.8854	2.7984
80000.	3.2849	3.1900	3.0974	3.0070	2.9153
90000.	3.4184	3.3187	3.2213	3.1263	3.0300
100000.	3.5497	3.4452	3.3432	3.2438	3.1430
110000.	3.6801	3.5709	3.4644	3.3607	3.2556
120000.	3.8147	3.7010	3.5901	3.4822	3.3728
130000.	3.9579	3.8398	3.7246	3.6125	3.4990
140000.	4.1135	3.9909	3.8713	3.7550	3.6373
150000.	4.2834	4.1561	4.0320	3.9113	3.7892
160000.	4.4713	4.3390	4.2100	4.0846	3.9576
170000.	4.6763	4.5385	4.4042	4.2736	4.1414
180000.	4.8983	4.7546	4.6144	4.4781	4.3401

Table A.1 cont'd.

	MU 90.5	MU 88.6	MU 86.6	MU 84.8	MU 83.1
ALT	VF	VF	VF	VF	VF
10000.	2.0340	1.9776	1.9202	1.8664	1.8128
20000.	2.1375	2.0778	2.0171	1.9601	1.9044
30000.	2.2491	2.1858	2.1214	2.0610	2.0020
40000.	2.3685	2.3013	2.2331	2.1690	2.1064
50000.	2.4872	2.4159	2.3435	2.2756	2.2094
60000.	2.6031	2.5276	2.4510	2.3792	2.3092
70000.	2.7167	2.6371	2.5563	2.4806	2.4087
80000.	2.8293	2.7455	2.6605	2.5808	2.5033
90000.	2.9398	2.8519	2.7627	2.6793	2.5980
100000.	3.0486	2.9567	2.8636	2.7763	2.6918
110000.	3.1571	3.0613	2.9643	2.8735	2.7882
120000.	3.2705	3.1709	3.0701	2.9758	2.8841
130000.	3.3927	3.2894	3.1848	3.0870	2.9919
140000.	3.5271	3.4199	3.3115	3.2101	3.1116
150000.	3.6748	3.5637	3.4513	3.3461	3.2439
160000.	3.8388	3.7233	3.6065	3.4972	3.3909
170000.	4.0177	3.8974	3.7756	3.6618	3.5511
180000.	4.2109	4.0853	3.9582	3.8393	3.7237

	MU 81.3	MU 79.5	MU 77.8	MU 76.2	MU 74.6
ALT	VF	VF	VF	VF	VF
10000.	1.7604	1.7082	1.6574	1.6096	1.5630
20000.	1.8479	1.7927	1.7390	1.6885	1.6392
30000.	1.9422	1.8838	1.8269	1.7734	1.7213
40000.	2.0429	1.9811	1.9207	1.8641	1.8090
50000.	2.1421	2.0766	2.0127	1.9529	1.8945
60000.	2.2381	2.1689	2.1015	2.0383	1.9768
70000.	2.3319	2.2590	2.1881	2.1216	2.0569
80000.	2.4246	2.3481	2.2736	2.2039	2.1369
90000.	2.5156	2.4355	2.3576	2.2847	2.2137
100000.	2.6055	2.5220	2.4407	2.3647	2.2908
110000.	2.6958	2.6089	2.5244	2.4454	2.3687
120000.	2.7913	2.7011	2.6135	2.5316	2.4521
130000.	2.8958	2.8024	2.7116	2.6268	2.5445
140000.	3.0120	2.9152	2.8212	2.7334	2.6481
150000.	3.1406	3.0402	2.9427	2.8517	2.7632
160000.	3.2835	3.1792	3.0779	2.9832	2.8912
170000.	3.4392	3.3304	3.2248	3.1261	3.0303
180000.	3.6068	3.4933	3.3829	3.2798	3.1797

Table A.1 cont'd.

	MU 73.0	MU 71.4	MU 69.8	MU 68.3	MU 66.8
ALT	VF	VF	VF	VF	VF
10000.	1.5157	1.4696	1.4247	1.3809	1.3367
20000.	1.5893	1.5406	1.4932	1.4469	1.4002
30000.	1.6685	1.6170	1.5669	1.5180	1.4687
40000.	1.7530	1.6985	1.6454	1.5938	1.5416
50000.	1.8354	1.7778	1.7217	1.6671	1.6120
60000.	1.9144	1.8538	1.7947	1.7372	1.6792
70000.	1.9913	1.9275	1.8655	1.8052	1.7443
80000.	2.0673	2.0005	1.9355	1.8724	1.8087
90000.	2.1419	2.0722	2.0044	1.9385	1.8721
100000.	2.2160	2.1434	2.0729	2.0044	1.9354
110000.	2.2910	2.2157	2.1425	2.0715	2.0000
120000.	2.3717	2.2936	2.2179	2.1444	2.0704
130000.	2.4613	2.3805	2.3022	2.2261	2.1496
140000.	2.5619	2.4783	2.3972	2.3185	2.2393
150000.	2.6739	2.5871	2.5030	2.4214	2.3392
160000.	2.7983	2.7081	2.6206	2.5357	2.4502
170000.	2.9334	2.8394	2.7481	2.6595	2.5704
180000.	3.0784	2.9802	2.8848	2.7922	2.6990

	MU 65.3	MU 63.9	MU 62.5	MU 61.1	MU 59.7
ALT	VF	VF	VF	VF	VF
10000.	1.2935	1.2531	1.2138	1.1741	1.1354
20000.	1.3547	1.3121	1.2706	1.2287	1.1880
30000.	1.4206	1.3756	1.3318	1.2876	1.2446
40000.	1.4908	1.4432	1.3970	1.3503	1.3049
50000.	1.5584	1.5083	1.4595	1.4103	1.3625
60000.	1.6229	1.5701	1.5189	1.4672	1.4169
70000.	1.6852	1.6299	1.5762	1.5221	1.4695
80000.	1.7469	1.6891	1.6330	1.5764	1.5216
90000.	1.8076	1.7475	1.6890	1.6302	1.5731
100000.	1.8684	1.8059	1.7453	1.6842	1.6250
110000.	1.9306	1.8659	1.8031	1.7399	1.6787
120000.	1.9987	1.9317	1.8668	1.8016	1.7383
130000.	2.0755	2.0063	1.9392	1.8718	1.8064
140000.	2.1625	2.0909	2.0215	1.9517	1.8841
150000.	2.2596	2.1853	2.1133	2.0408	1.9707
160000.	2.3673	2.2900	2.2151	2.1397	2.0666
170000.	2.4839	2.4033	2.3250	2.2463	2.1700
180000.	2.6086	2.5242	2.4424	2.3600	2.2802

Table A.1 cont'd.

	MU 58.3	MU 57.0	MU 55.7	MU 54.4	MU 53.2
ALT	VF	VF	VF	VF	VF
10000.	1.0978	1.0913	1.0258	0.9901	0.9554
20000.	1.1484	1.1100	1.0726	1.0350	0.9985
30000.	1.2029	1.1623	1.1230	1.0833	1.0449
40000.	1.2608	1.2180	1.1765	1.1347	1.0942
50000.	1.3161	1.2710	1.2273	1.1834	1.1408
60000.	1.3683	1.3210	1.2752	1.2291	1.1845
70000.	1.4186	1.3691	1.3212	1.2731	1.2265
80000.	1.4684	1.4169	1.3670	1.3168	1.2683
90000.	1.5178	1.4643	1.4124	1.3604	1.3100
100000.	1.5677	1.5122	1.4585	1.4046	1.3526
110000.	1.6195	1.5621	1.5066	1.4510	1.3972
120000.	1.6772	1.6179	1.5607	1.5033	1.4478
130000.	1.7433	1.6821	1.6229	1.5636	1.5063
140000.	1.8187	1.7553	1.6941	1.6327	1.5734
150000.	1.9028	1.8371	1.7735	1.7097	1.6481
160000.	1.9959	1.9274	1.8612	1.7948	1.7306
170000.	2.0962	2.0247	1.9555	1.8861	1.8190
180000.	2.2030	2.1281	2.0557	1.9830	1.9128

	MU 51.9	MU 50.7	MU 49.5	MU 48.4	MU 47.3
ALT	VF	VF	VF	VF	VF
10000.	0.9218	0.8892	0.8576	0.8269	0.7972
20000.	0.9631	0.9288	0.8956	0.8634	0.8322
30000.	1.0077	0.9716	0.9366	0.9027	0.8699
40000.	1.0549	1.0169	0.9800	0.9443	0.9098
50000.	1.0995	1.0596	1.0209	0.9834	0.9472
60000.	1.1413	1.0995	1.0590	1.0198	0.9820
70000.	1.1814	1.1378	1.0956	1.0548	1.0154
80000.	1.2214	1.1760	1.1322	1.0898	1.0488
90000.	1.2614	1.2143	1.1689	1.1250	1.0826
100000.	1.3022	1.2536	1.2066	1.1613	1.1175
110000.	1.3453	1.2951	1.2466	1.1999	1.1548
120000.	1.3942	1.3425	1.2926	1.2444	1.1979
130000.	1.4510	1.3976	1.3461	1.2963	1.2483
140000.	1.5161	1.4608	1.4074	1.3556	1.3061
150000.	1.5886	1.5312	1.4756	1.4220	1.3703
160000.	1.6685	1.6086	1.5507	1.4948	1.4408
170000.	1.7542	1.6915	1.6310	1.5725	1.5160
180000.	1.8449	1.7792	1.7158	1.6545	1.5953

Table A.1 cont'd.

	MU 46.1	MU 45.0	MU 43.9	MU 42.8	MU 41.7
ALT	VF	VF	VF	VF	VF
10000.	0.7674	0.7386	0.7108	0.6829	0.4671
20000.	0.8009	0.7706	0.7414	0.7122	0.4809
30000.	0.8370	0.8052	0.7744	0.7437	0.4961
40000.	0.8752	0.8418	0.8094	0.7772	0.5118
50000.	0.9109	0.8759	0.8420	0.8082	0.5240
60000.	0.9441	0.9075	0.8722	0.8369	0.5334
70000.	0.9760	0.9379	0.9011	0.8645	0.5415
80000.	1.0079	0.9684	0.9303	0.8923	0.5499
90000.	1.0402	0.9993	0.9599	0.9207	0.5585
100000.	1.0737	1.0316	0.9909	0.9505	0.5680
110000.	1.1097	1.0663	1.0244	0.9828	0.5792
120000.	1.1514	1.1067	1.0636	1.0207	0.5941
130000.	1.2003	1.1541	1.1096	1.0652	0.6134
140000.	1.2564	1.2084	1.1623	1.1163	0.6370
150000.	1.3186	1.2686	1.2208	1.1729	0.6642
160000.	1.3868	1.3347	1.2846	1.2346	0.6949
170000.	1.4595	1.4060	1.3528	1.3002	0.7283
180000.	1.5361	1.4790	1.4239	1.3690	0.7641

	MU 40.7	MU 39.7	MU 38.7	MU 37.7	MU 36.7
ALT	VF	VF	VF	VF	VF
10000.	0.4441	0.4222	0.4014	0.3811	0.3617
20000.	0.4573	0.4348	0.4134	0.3924	0.3725
30000.	0.4717	0.4485	0.4264	0.4048	0.3843
40000.	0.4867	0.4628	0.4400	0.4177	0.3965
50000.	0.4983	0.4738	0.4506	0.4277	0.4061
60000.	0.5072	0.4824	0.4587	0.4355	0.4135
70000.	0.5151	0.4899	0.4660	0.4425	0.4201
80000.	0.5231	0.4976	0.4734	0.4496	0.4270
90000.	0.5314	0.5057	0.4812	0.4571	0.4343
100000.	0.5407	0.5147	0.4899	0.4656	0.4425
110000.	0.5516	0.5253	0.5002	0.4756	0.4522
120000.	0.5661	0.5394	0.5139	0.4889	0.4652
130000.	0.5848	0.5575	0.5315	0.5060	0.4816
140000.	0.6076	0.5795	0.5528	0.5265	0.5015
150000.	0.6338	0.6048	0.5772	0.5500	0.5241
160000.	0.6633	0.6332	0.6045	0.5762	0.5492
170000.	0.6954	0.6640	0.6340	0.6044	0.5763
180000.	0.7296	0.6968	0.6655	0.6346	0.6051

Table A.1 cont'd.

	MU 35.8	MU 34.8	MU 33.9	MU 33.0	MU 32.1
ALT	VF	VF	VF	VF	VF
10000.	0.3433	0.3253	0.3083	0.2917	0.2759
20000.	0.3536	0.3351	0.3175	0.3004	0.2842
30000.	0.3648	0.3457	0.3276	0.3099	0.2931
40000.	0.3764	0.3568	0.3381	0.3199	0.3027
50000.	0.3855	0.3654	0.3463	0.3277	0.3100
60000.	0.3926	0.3722	0.3528	0.3338	0.3159
70000.	0.3990	0.3782	0.3586	0.3394	0.3212
80000.	0.4056	0.3846	0.3647	0.3452	0.3268
90000.	0.4126	0.3914	0.3712	0.3516	0.3329
100000.	0.4206	0.3991	0.3787	0.3588	0.3400
110000.	0.4301	0.4083	0.3876	0.3675	0.3483
120000.	0.4426	0.4204	0.3994	0.3789	0.3594
130000.	0.4585	0.4359	0.4143	0.3932	0.3732
140000.	0.4777	0.4543	0.4320	0.4103	0.3896
150000.	0.4994	0.4751	0.4521	0.4295	0.4081
160000.	0.5235	0.4983	0.4742	0.4507	0.4283
170000.	0.5495	0.5231	0.4980	0.4734	0.4500
180000.	0.5770	0.5494	0.5232	0.4974	0.4729

	MU 31.2	MU 30.3	MU 29.4	MU 28.6	MU 27.7
ALT	VF	VF	VF	VF	VF
10000.	0.2610	0.2465	0.2328	0.2198	0.2066
20000.	0.2689	0.2539	0.2398	0.2261	0.2129
30000.	0.2774	0.2620	0.2475	0.2334	0.2197
40000.	0.2864	0.2705	0.2555	0.2409	0.2268
50000.	0.2934	0.2771	0.2618	0.2469	0.2325
60000.	0.2990	0.2824	0.2669	0.2517	0.2370
70000.	0.3040	0.2873	0.2715	0.2561	0.2412
80000.	0.3094	0.2925	0.2765	0.2609	0.2458
90000.	0.3153	0.2982	0.2819	0.2662	0.2509
100000.	0.3221	0.3047	0.2883	0.2723	0.2568
110000.	0.3302	0.3126	0.2959	0.2796	0.2639
120000.	0.3409	0.3229	0.3059	0.2893	0.2732
130000.	0.3543	0.3358	0.3182	0.3012	0.2846
140000.	0.3700	0.3509	0.3328	0.3151	0.2979
150000.	0.3877	0.3678	0.3490	0.3306	0.3127
160000.	0.4071	0.3864	0.3667	0.3474	0.3287
170000.	0.4278	0.4061	0.3855	0.3654	0.3458
180000.	0.4497	0.4269	0.4053	0.3842	0.3637

Table A.1 cont'd.

	MU 26.9	MU 26.1	MU 25.3	MU 24.5	MU 23.8
ALT	VF	VF	VF	VF	VF
10000.	0.1945	0.1831	0.1724	0.1620	0.1517
20000.	0.2004	0.1886	0.1776	0.1669	0.1563
30000.	0.2068	0.1947	0.1833	0.1723	0.1614
40000.	0.2135	0.2010	0.1893	0.1779	0.1667
50000.	0.2189	0.2061	0.1940	0.1824	0.1709
60000.	0.2232	0.2102	0.1979	0.1861	0.1744
70000.	0.2272	0.2140	0.2016	0.1896	0.1777
80000.	0.2316	0.2182	0.2056	0.1934	0.1813
90000.	0.2364	0.2229	0.2101	0.1977	0.1855
100000.	0.2421	0.2284	0.2154	0.2028	0.1904
110000.	0.2490	0.2350	0.2218	0.2090	0.1964
120000.	0.2580	0.2436	0.2301	0.2170	0.2040
130000.	0.2689	0.2542	0.2402	0.2267	0.2133
140000.	0.2817	0.2663	0.2518	0.2378	0.2238
150000.	0.2958	0.2798	0.2647	0.2500	0.2354
160000.	0.3111	0.2943	0.2785	0.2632	0.2479
170000.	0.3273	0.3097	0.2932	0.2771	0.2611
180000.	0.3442	0.3259	0.3085	0.2916	0.2748

	MU 23.0	MU 22.2	MU 21.5	MU 20.8	MU 20.0
ALT	VF	VF	VF	VF	VF
10000.	0.1421	0.1331	0.1244	0.1162	0.1083
20000.	0.1464	0.1371	0.1282	0.1197	0.1116
30000.	0.1511	0.1416	0.1324	0.1236	0.1152
40000.	0.1561	0.1463	0.1368	0.1277	0.1191
50000.	0.1601	0.1500	0.1403	0.1310	0.1222
60000.	0.1634	0.1531	0.1433	0.1338	0.1248
70000.	0.1666	0.1561	0.1461	0.1365	0.1273
80000.	0.1700	0.1595	0.1493	0.1395	0.1302
90000.	0.1740	0.1633	0.1529	0.1430	0.1336
100000.	0.1787	0.1678	0.1573	0.1472	0.1376
110000.	0.1845	0.1733	0.1626	0.1523	0.1424
120000.	0.1918	0.1803	0.1693	0.1587	0.1486
130000.	0.2006	0.1888	0.1774	0.1664	0.1559
140000.	0.2107	0.1984	0.1865	0.1750	0.1640
150000.	0.2217	0.2088	0.1964	0.1844	0.1729
160000.	0.2335	0.2200	0.2070	0.1944	0.1824
170000.	0.2460	0.2318	0.2181	0.2049	0.1922
180000.	0.2589	0.2440	0.2296	0.2158	0.2025

APPENDIX B

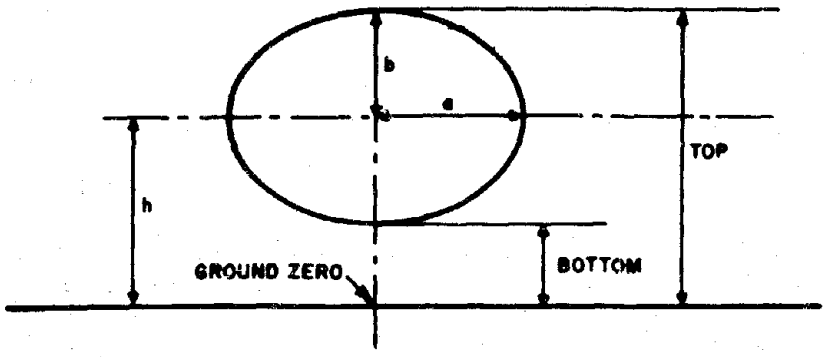
CLOUD DIMENSION TABULATION

Table B.1 summarizes the cloud dimensions obtained from Eq. (2) through (5) for 21 specific yield values which were used to establish the fallout parameters for graphical application of the model.

TABLE B.1

Summary of Cloud Dimensions Obtained From Eqs. (2) through (5) for the Specific Yield Values Used to Establish the Fallout Parameters for Graphical Presentation of the Model

	Dimensions (feet)				
Yield (KT)	a	b	h	Bottom	Top
1	2,450	1,400	6,610	5,210	8,010
2.5	3,840	1,840	9,930	8,090	11,800
5	4,900	2,270	13,500	11,200	15,800
7.5	5,840	2,560	16,200	13,600	18,800
10	6,610	2,790	18,400	15,600	21,200
25	9,810	3,680	27,700	24,000	31,400
50	13,200	4,530	32,000	27,500	36,500
75	15,800	5,110	34,200	29,100	39,300
100	17,800	5,570	35,800	30,200	41,400
250	26,500	7,340	41,600	34,300	48,900
500	35,700	9,030	46,600	37,600	55,600
750	42,500	10,200	49,800	39,600	60,000
1000	48,100	11,100	52,200	41,100	63,300
2500	71,400	14,600	60,700	46,100	75,300
5000	96,200	18,000	68,000	50,000	86,000
7500	115,000	20,400	72,700	52,300	93,100
10000	130,000	22,200	76,200	54,000	98,400
25000	193,000	29,200	88,600	59,400	118,000
50000	260,000	36,000	99,200	63,200	135,000
75000	309,000	40,600	106,000	65,400	147,000
100000	350,000	44,300	111,000	66,700	155,000



APPENDIX C

SOLUTIONS FOR DOWNWIND RADIATION PROFILES AND OTHER MODEL PARAMETERS FOR 21 WEAPON YIELDS

C.1 RADIATION INTENSITY PROFILES

The scaling equations used to define the identifying features of the downwind standard radiation intensity profile shown in Fig. C.1 are given below. They apply to a wind speed of 15 mph and a surface burst of 100 % fission yield. Distances are in feet, intensities in r/hr at 1 hour and weapon yields are in KT.

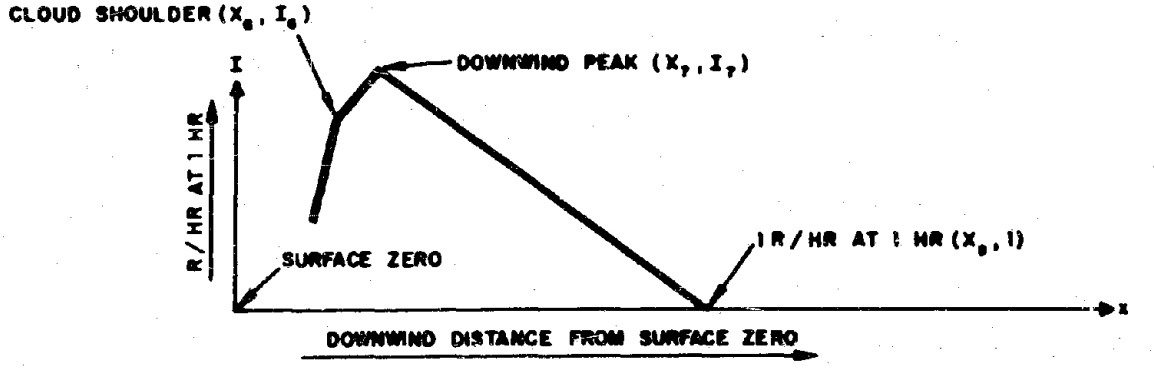


Fig. C.1 Typical Downwind Center Plane Standard Intensity Profile

For the cloud shoulder point:

$$\log X_6 = 3.850 + 0.481 \log W, \quad W = 1 \text{ to } 28 \text{ KT} \tag{C-1}$$

$$= 4.255 + 0.200 \log W, \quad W = 28 \text{ to } 10^5 \text{ KT} \tag{C-2}$$

$$I_6 = 4.606\, a\, K_6\, \bar{A}_\alpha \log \phi_6, \quad \alpha_6 \geq a/h \tag{C-3}$$

$$= 4.606\, a\, K_6'\, \bar{A}_\alpha \log \phi_6, \quad \alpha_6 < a/h \tag{C-4}$$

where

$$\log a/h = -0.431 - 0.014 \log W, \quad W = 1 \text{ to } 28 \text{ KT} \tag{C-5}$$

$$= -0.837 + 0.267 \log W, \quad W = 28 \text{ to } 10^5 \text{ KT} \tag{C-6}$$

$$\phi_6 = \frac{(\alpha_6 + a/h) + \sqrt{(a/b)^2 + (\alpha_6 + a/h)^2}}{(\alpha_6 - a/h) + \sqrt{(a/b)^2 + (\alpha_6 - a/h)^2}}, \quad \alpha_6 \geq a/h \tag{C-7}$$

$$\phi_6' = \frac{(\alpha_6 + a/h) + \sqrt{(a/b)^2 + (\alpha_6 + a/h)^2}}{\alpha_{2,3} + \sqrt{(a/b)^2 + (a/b)^2 + \alpha_{2,3}^2}}, \quad \alpha_6 < a/h \tag{C-8}$$

$$\log (a/b)^2 = 0.486 + 0.262 \log W, \quad W = 1 \text{ to } 10^5 \text{ KT} \tag{C-9}$$

$$\log a = 3.389 + 0.431 \log W, \quad W = 1 \text{ to } 10^5 \text{ KT} \tag{C-10}$$

$$\log K_6 \bar{A}_\alpha = -1.134 - 0.074 \log W, \quad W = 1 \text{ to } 10^5 \text{ KT}, \ \alpha_6 \geq a/h \tag{C-11}$$

$$\log K_6' \bar{A}_\alpha = -1.225 - 0.022 \log W, \quad W = 1 \text{ to } 10^5 \text{ KT}, \ \alpha_6 < a/h \tag{C-12}$$

$$\log \alpha_{2,3} = -0.509 + 0.076 \log W, \quad W = 1 \text{ to } 10^5 \text{ KT} \tag{C-13}$$

$$\log \alpha_6 = 0.030 + 0.036 \log W, \quad W = 1 \text{ to } 10^5 \text{ KT} \tag{C-14}$$

For the downwind peak:

$$\log X_7 = 3.862 + 0.586 \log W, \quad W = 1 \text{ to } 28 \text{ KT} \tag{C-15}$$

$$= 4.268 + 0.305 \log W, \quad W = 28 \text{ to } 10^5 \text{ KT} \tag{C-16}$$

$$I_7 = 4.606\, a\, K_7\, \bar{A}_\alpha \log \phi_7, \quad \alpha_7 \geq a/h \tag{C-17}$$

$$= 4.606\, a\, K_7'\, \bar{A}_\alpha \log \phi_7', \quad \alpha_7 < a/h \tag{C-18}$$

where

$$\log a/h = -0.431 - 0.014 \log W, \quad W = 1 \text{ to } 28 \text{ KT} \tag{C-19}$$

$$= -0.837 + 0.267 \log W, \quad W = 28 \text{ to } 10^5 \text{ KT} \tag{C-20}$$

$$\phi_7 = \frac{(\alpha_7 + a/h) + \sqrt{(a/b)^2 + (\alpha_7 + a/h)^2}}{(\alpha_7 - a/h) + \sqrt{(a/b)^2 + (\alpha_7 - a/h)^2}}, \quad \alpha_7 \geq a/h \tag{C-21}$$

$$\phi_7' = \frac{(\alpha_7 + a/h) + \sqrt{(a/b)^2 + (\alpha_7 + a/h)^2}}{\alpha_{2,3} + \sqrt{(a/b)^2 + \alpha_{2,3}^2}}, \quad \alpha_7 < a/h \tag{C-22}$$

$$\log (a/b)^2 = 0.486 + 0.262 \log W, \quad W = 1 \text{ to } 10^5 \text{ KT} \tag{C-23}$$

$$\log a = 3.389 + 0.431 \log W, \quad W = 1 \text{ to } 10^5 \text{ KT} \tag{C-24}$$

$$\log K_7 \bar{A}_\alpha = -0.989 - 0.037 \log W, \quad W = 1 \text{ to } 10^5 \text{ KT}, \ \alpha_7 \geq a/h \tag{C-25}$$

$$\log K_7' \bar{A}_\alpha = -1.079 - 0.020 \log W, \quad W = 1 \text{ to } 10^5 \text{ KT}, \ \alpha_7 < a/h \tag{C-26}$$

$$\log \alpha_{2,3} = -0.509 + 0.076 \log W, \quad W = 1 \text{ to } 10^5 \text{ KT} \tag{C-27}$$

$$\log \alpha_7 = 0.043 + 0.141 \log W, \quad W = 1 \text{ to } 10^5 \text{ KT} \tag{C-28}$$

For the 1 r/hr at 1 hr point:

$$\log X_9 = 5.190 + 0.319 \log W, \quad W = 1 \text{ to } 28 \text{ KT} \tag{C-29}$$

$$= 5.202 + 0.311 \log W, \quad W = 28 \text{ to } 10^5 \text{ KT} \tag{C-30}$$

Solutions of the above equations defining the significant downwind standard intensity profile features are summarized in Table C.1. Intermediate values at approximately equal increments of standard intensity are given in Table C.2.

C.2 OTHER MODEL PARAMETERS

Computer solutions for other model parameters for 21 yields at the intermediate downwind distance and standard intensity points solved for in Section C.1 and used in plotting Figs. 2a, 2b, 3 and 4 are given in Table C.2. A, B and H are the stabilized cloud dimensions summarized in Table B.1. The particle size range diameters are the maximum and minimum sizes determined by steps (a) through (e) in Section 2.4 and the maximum and minimum terminal velocities v_f are those computed in step (d).

To extend the scope and usefulness of the model beyond its application to date, estimates of the variation of the mass-contour ratio with yield and downwind distances computed from recently developed equations have been included in Table C.2. The mass-contour ratios were computed from Reference 2 (Eq. 4.17) which gives the mass contour scaling function for a land surface burst as

$$M_r(1) = \frac{1.83 \times 10^{-11} f(\alpha) W^{-0.083}}{B[r_\alpha(1)+0.019]} \quad \frac{mg/ft^2}{r/hr \text{ at } 1 \text{ hr}} \qquad (C\text{-}30)$$

where

$$f(\alpha) \quad 7.46 \times 10^{11} \alpha^{-1.25} \text{ mg/KT} \qquad \alpha = 0.1 \text{ to } 0.9 \qquad (C\text{-}31)$$

$$f(\alpha) \quad 7.90 \times 10^{11} \alpha^{-0.690} \text{ mg/KT} \qquad \alpha = 0.9 \text{ to } 20 \qquad (C\text{-}32)$$

$$f(\alpha) \quad 1.0 \times 10^{11} \text{ mg/KT} \qquad \alpha > 20 \qquad (C\text{-}33)$$

$B = 1.0$ for a 100 % fission weapon of yield WKT

$r_\alpha(1)$ is determined from Fig. 4.2 in Reference 2.

The corresponding deposited initial mass levels were computed using Eq. (11).

TABLE C.1

Summary of Radiation Intensity Profile Control Points Computed From Equations (C-1) through (C-30) for the Specific Yield Values Used for Graphical Presentation of the Model

Yield (KT)	Center Plane Intensity Profile Control Points				
	Cloud Shoulder		Downwind Peak		1 r/hr at 1 hr
	X (ft)	I(r/hr at 1 hr)	X (ft)	I(rh/r at 1 hr)	X (ft)
1	7,080	130	7,280	180	155,000
2.5	11,000	161	12,500	225	207,000
5	15,400	190	18,700	267	259,000
7.5	18,700	208	23,700	296	295,000
10	21,400	223	28,100	317	323,000
25	33,300	275	48,000	397	432,000
50	39,300	379	61,100	556	538,000
75	42,700	465	69,200	688	610,000
100	45,200	538	75,500	801	667,000
250	54,300	854	99,900	1,300	887,000
500	62,300	1,209	123,000	1,870	1,100,000
750	67,600	1,480	140,000	2,310	1,250,000
1000	71,600	1,710	152,000	2,690	1,360,000
2500	86,000	2,700	202,000	4,360	1,810,000
5000	98,800	3,810	249,000	6,290	2,250,000
7500	107,000	4,610	282,000	7,780	2,550,000
10000	114,000	5,250	308,000	9,060	2,790,000
25000	136,000	8,010	407,000	14,700	3,710,000
50000	157,000	11,100	503,000	21,100	4,610,000
75000	170,000	13,500	569,000	26,200	5,230,000
100000	180,000	15,500	621,000	30,400	5,710,000

Table C.2

Computer Solutions of Fallout Model Equations for 21 Weapon Yields

WEAPON YIELD = 1.00 KT

A = 2449. FT B = 1400. FT H = 6607. FT

	DOWNWIND DISTANCE X (FEET)		STANDARD INTENSITY (R/HR AT 1 HR)	PARTICLE SIZE RANGE DIAMETER (MICRONS) MIN	MAX	AVERAGE TERMINAL VELOCITY VF(FT/SEC) MIN	MAX	DEPOSITED INITIAL MASS (MG/SQ FT)	MASS CONTOUR RATIO (MG/SQ FT) (R/HR AT 1 HR)
X6	7079.	I6	129.88	561.478	1790.396	14.018	32.628	3603.730	27.747
	7105.		135.43	559.539	1775.518	13.978	32.455	3730.564	27.545
	7129.		140.99	557.687	1761.389	13.939	32.291	3856.287	27.351
	7153.		146.55	555.916	1747.945	13.903	32.135	3980.955	27.165
	7176.		152.10	554.240	1735.414	13.868	31.986	4106.109	26.995
	7197.		157.66	552.634	1723.709	13.834	31.844	4231.682	26.841
	7219.		163.22	551.091	1712.492	13.802	31.708	4356.755	26.693
	7239.		168.77	549.605	1701.753	13.771	31.578	4481.351	26.552
	7259.		174.33	548.174	1691.449	13.741	31.453	4605.490	26.418
X7	7278.	I7	179.89	546.794	1681.547	13.712	31.333	4729.191	26.290
	8728.		170.94	459.098	1157.097	11.813	24.342	3382.285	19.786
	10255.		162.00	393.143	868.463	10.293	19.768	2668.748	16.474
	11870.		153.05	341.876	688.303	9.049	16.531	2190.816	14.314
	13582.		144.11	300.961	565.947	8.014	14.110	1811.539	12.571
	15403.		135.17	267.573	477.595	7.138	12.225	1515.442	11.212
	17349.		126.22	239.798	410.828	6.387	10.709	1273.755	10.091
	19439.		117.28	216.311	358.525	5.736	9.460	1076.606	9.180
	21694.		108.33	196.141	316.336	5.166	8.408	909.479	8.395
	24144.		99.39	178.586	281.461	4.660	7.506	767.019	7.717
	26825.		90.44	163.111	252.023	4.208	6.720	643.002	7.109
	29785.		81.50	149.299	226.715	3.800	6.027	534.229	6.555
	33089.		72.55	136.821	204.574	3.428	5.406	439.731	6.061
	36829.		63.61	125.404	184.889	3.086	4.843	357.712	5.623
	41137.		54.67	114.815	167.088	2.767	4.325	284.519	5.205
	46216.		45.72	104.834	150.699	2.466	3.842	218.921	4.788
	52405.		36.78	95.236	135.280	2.177	3.382	160.743	4.371
	60326.		27.83	85.742	120.345	1.893	2.934	109.957	3.951
	71346.		18.89	75.907	105.200	1.602	2.477	65.837	3.486
	89584.		9.94	64.692	88.328	1.277	1.970	29.349	2.951
X9	154882.	I9	1.00	45.028	59.734	0.739	1.138	2.318	2.318

WEAPON YIELD = 2.50 KT

A = 3635. FT B = 1842. FT H = 9933. FT

Table C.2 cont'd.

	DOWNWIND DISTANCE X (FEET)		STANDARD INTENSITY (R/HR AT 1 HR)	PARTICLE SIZE RANGE DIAMETER (MICRONS) MIN	MAX	AVERAGE TERMINAL VELOCITY VF(FT/SEC) MIN	MAX	DEPOSITED INITIAL MASS (MG/SQ FT)	MASS CONTOUR RATIO (MG/SQ FT) (R/HR AT 1 HR)
X6	11000.	I6	161.24	558.743	1614.029	13.961	30.640	3969.327	24.617
	11188.		168.38	549.792	1555.614	13.775	29.902	4018.247	23.865
	11367.		175.51	541.464	1502.331	13.600	29.228	4071.322	23.197
	11540.		182.65	533.710	1455.187	13.437	28.610	4127.867	22.600
	11705.		189.78	526.467	1411.744	13.283	28.040	4187.335	22.064
	11865.		196.92	519.648	1372.753	13.138	27.512	4249.288	21.579
	12019.		204.05	513.280	1336.709	13.001	27.023	4313.367	21.139
	12168.		211.19	507.250	1303.724	12.872	26.567	4379.277	20.737
	12312.		218.32	501.564	1273.355	12.749	26.141	4446.773	20.368
X7	12451.	I7	225.45	496.192	1244.903	12.632	25.742	4515.650	20.029
	14288.		214.23	434.753	962.042	11.262	21.443	3586.917	16.743
	16225.		203.01	384.947	776.010	10.098	18.262	2982.023	14.689
	18272.		191.79	343.789	645.262	9.097	15.808	2511.803	13.097
	20442.		180.56	309.222	548.686	8.226	13.852	2122.741	11.756
	22752.		169.34	279.776	474.525	7.461	12.251	1805.763	10.663
	25220.		158.12	254.372	415.825	6.784	10.914	1536.746	9.719
	27870.		146.90	232.201	368.100	6.178	9.775	1311.421	8.928
	30730.		135.67	212.641	328.467	5.633	8.791	1117.624	8.238
	33838.		124.45	195.211	294.920	5.139	7.928	948.460	7.621
	37240.		113.23	179.526	266.034	4.687	7.162	800.645	7.071
	40997.		102.00	165.271	240.777	4.272	6.474	669.194	6.560
	45192.		90.78	152.186	218.368	3.896	5.848	552.231	6.083
	49941.		79.56	140.042	198.192	3.524	5.273	449.128	5.645
	55414.		68.34	128.635	179.747	3.183	4.738	358.628	5.248
	61872.		57.11	117.760	162.596	2.856	4.233	277.540	4.859
	69746.		45.89	107.193	146.311	2.537	3.746	204.700	4.461
	79840.		34.67	96.638	130.402	2.219	3.266	140.190	4.044
	93918.		23.45	85.600	114.127	1.889	2.771	84.339	3.597
	117363.		12.22	72.875	95.804	1.513	2.214	37.240	3.047
X9	207464.	I9	1.00	49.534	63.379	0.857	1.250	2.148	2.148

WEAPON YIELD = 5.00 KT

A = 4901. FT B = 2268. FT H = 13522. FT

Table C.2 cont'd.

	DOWNWIND DISTANCE X (FEET)		STANDARD INTENSITY (R/HR AT 1 HR)	PARTICLE SIZE RANGE DIAMETER (MICRONS) MIN	MAX	AVERAGE TERMINAL VELOCITY VF(FT/SEC) MIN	MAX	DEPOSITED INITIAL MASS (MG/SQ FT)	MASS CONTOUR RATIO (MG/SQ FT) (R/HR AT 1 HR)
X6	15353.	I6	189.58	545.299	1447.708	13.881	29.267	4258.974	22.465
	15786.		198.23	531.159	1365.140	13.576	28.133	4241.051	21.395
	16200.		206.88	518.287	1294.144	13.297	27.129	4238.737	20.489
	16597.		215.53	506.538	1232.389	13.039	26.232	4248.814	19.713
	16979.		224.18	495.762	1178.217	12.800	25.426	4268.888	19.042
	17346.		232.83	485.811	1130.527	12.578	24.697	4297.135	18.456
	17700.		241.48	476.601	1087.927	12.371	24.035	4332.143	17.940
	18041.		250.13	468.065	1049.613	12.177	23.429	4372.797	17.482
	18371.		258.78	460.085	1015.134	11.996	22.872	4418.204	17.073
X7	18689.	I7	267.43	452.662	983.904	11.825	22.360	4467.641	16.706
	20885.		254.11	407.478	811.619	10.767	19.382	3745.885	14.741
	23198.		240.78	369.018	685.721	9.833	17.012	3210.553	13.334
	25643.		227.46	335.879	590.099	9.003	15.078	2746.260	12.073
	28236.		214.14	307.014	515.067	8.260	13.466	2358.954	11.016
	30996.		200.82	281.633	454.650	7.590	12.098	2032.143	10.119
	33945.		187.50	259.109	404.921	6.981	10.919	1747.680	9.321
	37111.		174.18	238.953	363.216	6.426	9.891	1503.476	8.632
	40529.		160.86	220.772	327.652	5.916	8.982	1290.763	8.024
	44243.		147.53	204.239	296.872	5.445	8.170	1102.123	7.470
	48309.		134.21	189.093	269.864	5.007	7.437	934.950	6.966
	52800.		120.89	175.099	245.857	4.597	6.769	785.912	6.501
	57816.		107.57	162.063	224.248	4.211	6.154	651.433	6.056
	63496.		94.25	149.799	204.539	3.845	5.581	530.964	5.634
	70043.		80.93	138.134	186.314	3.494	5.042	424.176	5.231
	77770.		67.61	126.886	169.187	3.153	4.527	329.491	4.874
	87198.		54.29	115.837	152.764	2.818	4.027	244.132	4.497
	99295.		40.96	104.688	136.567	2.479	3.528	167.748	4.095
	116194.		27.64	92.908	119.840	2.122	3.008	101.102	3.657
	144447.		14.32	79.173	100.798	1.709	2.415	44.618	3.115
X9	258304.	I9	1.00	52.291	65.780	0.956	1.344	2.050	2.050

WEAPON YIELD = 7.50 KT

A = 5836. FT B = 2562. FT H = 16196. FT

Table C.2 cont'd.

	DOWNWIND DISTANCE X (FEET)		STANDARD INTENSITY (R/HR AT 1 HR)	PARTICLE SIZE RANGE DIAMETER (MICRONS) MIN	MAX	AVERAGE TERMINAL VELOCITY VF(FT/SEC) MIN	MAX	DEPOSITED INITIAL MASS (MG/SQ FT)	MASS CONTOUR RATIO (MG/SQ FT) (R/HR AT 1 HR)
X6	18660.	I6	208.28	531.836	1353.933	13.821	28.510	4433.095	21.285
	19315.		217.97	514.881	1260.919	13.445	27.156	4373.516	20.065
	19942.		227.66	499.665	1182.841	13.103	25.978	4339.663	19.062
	20543.		237.35	485.920	1116.393	12.791	24.943	4325.551	18.224
	21120.		247.04	473.431	1059.172	12.505	24.026	4326.898	17.515
	21675.		256.74	462.039	1009.384	12.241	23.207	4340.551	16.907
	22209.		266.43	451.599	965.650	11.996	22.471	4364.133	16.380
	22724.		276.12	441.975	926.910	11.770	21.805	4395.811	15.920
	23221.		285.81	433.066	892.336	11.558	21.199	4434.147	15.514
X7	23702.	I7	295.51	424.822	861.258	11.361	20.645	4477.990	15.154
	26136.		280.78	387.604	732.458	10.455	18.242	3843.972	13.690
	28700.		266.06	355.141	633.414	9.640	16.261	3337.461	12.544
	31411.		251.33	326.550	555.032	8.903	14.595	2879.398	11.457
	34286.		236.60	301.138	491.526	8.232	13.173	2495.834	10.549
	37345.		221.88	278.433	439.005	7.619	11.941	2165.664	9.761
	40614.		207.15	257.947	394.792	7.054	10.861	1874.084	9.047
	44125.		192.43	239.356	356.998	6.533	9.905	1620.385	8.421
	47915.		177.70	222.364	324.262	6.048	9.048	1397.337	7.863
	52033.		162.98	206.730	295.525	5.596	8.274	1197.839	7.350
	56542.		148.25	192.244	269.997	5.171	7.568	1019.388	6.876
	61522.		133.53	178.727	247.067	4.770	6.918	859.590	6.438
	67086.		118.80	166.015	226.226	4.388	6.315	714.857	6.017
	73386.		104.08	153.950	207.054	4.023	5.749	584.073	5.612
	80649.		89.35	142.381	189.165	3.670	5.212	466.932	5.226
	89223.		74.63	131.136	172.271	3.325	4.696	363.042	4.865
	99687.		59.90	120.009	155.943	2.983	4.191	269.793	4.504
	113119.		45.18	108.697	139.734	2.633	3.683	185.964	4.116
	131900.		30.45	96.659	122.883	2.263	3.151	112.127	3.682
	163362.		15.73	82.503	103.552	1.830	2.538	49.575	3.153
X9	294540.	I9	1.00	54.835	67.134	1.017	1.403	2.059	2.059

WEAPON YIELD = 10.00 KT

A = 6607. FT B = 2793. FT H = 18408. FT

Table C.2 cont'd.

	DOWNWIND DISTANCE X (FEET)		STANDARD INTENSITY (R/HR AT 1 HR)	PARTICLE SIZE RANGE DIAMETER (MICRONS) MIN	MAX	AVERAGE TERMINAL VELOCITY VF(FT/SEC) MIN	MAX	DEPOSITED INITIAL MASS (MG/SQ FT)	MASS CONTOUR RATIO (MG/SQ FT) (R/HR AT 1 HR)
X6	21429.	I6	222.59	521.207	1288.915	13.774	27.993	4559.077	20.482
	22292.		233.10	502.373	1189.976	13.346	26.486	4468.672	19.172
	23117.		243.61	485.631	1108.288	12.959	25.193	4413.182	18.116
	23907.		254.12	470.633	1039.898	12.609	24.070	4383.325	17.249
	24666.		264.63	457.113	981.610	12.290	23.085	4373.259	16.526
	25394.		275.15	444.852	931.373	11.998	22.212	4378.635	15.914
	26096.		285.66	433.675	887.643	11.729	21.434	4396.234	15.390
	26772.		296.17	423.457	849.226	11.481	20.735	4423.609	14.936
	27424.		306.68	414.060	815.201	11.251	20.103	4458.858	14.539
X7	28054.	I7	317.20	405.378	784.851	11.036	19.529	4500.474	14.188
	30671.		301.39	373.088	680.116	10.226	17.466	3915.987	12.993
	33429.		285.58	344.454	596.953	9.489	15.725	3417.637	11.968
	36344.		269.77	318.871	529.408	8.814	14.233	2972.066	11.017
	39435.		253.96	295.856	473.417	8.193	12.939	2592.009	10.207
	42725.		238.15	275.013	426.267	7.619	11.802	2260.388	9.492
	46241.		222.34	256.021	385.949	7.087	10.793	1964.540	8.836
	50017.		206.53	238.608	351.039	6.591	9.890	1704.852	8.255
	54093.		190.72	222.548	320.428	6.126	9.073	1474.967	7.734
	58522.		174.91	207.645	293.294	5.689	8.329	1268.063	7.250
	63371.		159.10	193.728	268.973	5.276	7.646	1081.762	6.799
	68728.		143.29	180.645	246.949	4.883	7.012	914.257	6.381
	74712.		127.48	168.253	226.789	4.507	6.420	762.192	5.979
	81490.		111.67	156.418	208.122	4.144	5.861	623.980	5.588
	89303.		95.86	144.997	190.620	3.792	5.328	499.378	5.210
	98529.		80.05	133.831	173.963	3.445	4.812	388.491	4.853
	109790.		64.24	122.717	157.797	3.099	4.305	289.252	4.503
	124250.		48.43	111.355	141.666	2.744	3.793	199.804	4.126
	144478.		32.62	99.193	124.808	2.364	3.253	120.593	3.697
	178410.		16.81	84.798	105.356	1.918	2.628	53.381	3.176
X9	322849.	I9	1.00	56.123	68.039	1.063	1.447	2.064	2.064

WEAPON YIELD = 25.00 KT

A = 9806. FT B = 3676. FT M = 27675. FT

Table C.2 cont'd.

	DOWNWIND DISTANCE X (FEET)		STANDARD INTENSITY (R/HR AT 1 HR)	PARTICLE SIZE RANGE DIAMETER (MICRONS) MIN	MAX	AVERAGE TERMINAL VELOCITY VF(FT/SEC) MIN	MAX	DEPOSITED INITIAL MASS (MG/SQ FT)	MASS CONTOUR RATIO (MG/SQ FT) (R/HR AT 1 HR)
X6	33297.	15	274.64	479.966	1081.864	13.601	26.443	4976.107	18.119
	35225.		288.29	456.045	972.457	12.999	24.474	4782.828	16.590
	37065.		301.93	435.432	886.800	12.471	22.855	4661.422	15.439
	38822.		315.58	417.488	817.961	12.004	21.499	4589.476	14.543
	40505.		329.22	401.699	761.427	11.588	20.346	4552.657	13.828
	42120.		342.87	387.686	714.173	11.214	19.353	4541.279	13.245
	43672.		356.51	375.176	674.164	10.876	18.487	4548.479	12.758
	45166.		370.16	363.922	639.739	10.569	17.725	4569.194	12.344
	46605.		383.80	353.735	609.881	10.289	17.049	4599.552	11.984
X7	47995.	17	397.45	344.468	583.699	10.032	16.445	4636.509	11.666
	51281.		377.63	324.494	530.243	9.471	15.176	4126.323	10.927
	54745.		357.80	305.979	484.073	8.942	14.038	3635.917	10.246
	58406.		337.98	288.762	443.779	8.443	13.011	3258.004	9.640
	62288.		318.16	272.676	408.276	7.969	12.077	2891.586	9.088
	66421.		298.34	257.587	376.717	7.519	11.223	2558.517	8.576
	70837.		278.51	243.390	348.439	7.089	10.436	2253.920	8.093
	75580.		258.69	229.967	322.884	6.679	9.708	1979.751	7.653
	80701.		238.87	217.230	299.620	6.285	9.031	1730.754	7.246
	86266.		219.05	205.084	278.289	5.905	8.396	1502.383	6.859
	92359.		199.22	193.451	258.583	5.537	7.797	1292.698	6.489
	99091.		179.40	182.243	240.236	5.180	7.230	1100.790	6.136
	106612.		159.58	171.378	223.014	4.832	6.687	924.939	5.796
	115132.		139.76	160.768	206.691	4.488	6.165	762.871	5.459
	124958.		119.93	150.304	191.045	4.148	5.657	614.274	5.122
	136563.		100.11	139.858	175.845	3.806	5.157	479.208	4.787
	150737.		80.29	129.241	160.798	3.457	4.655	358.120	4.460
	168950.		60.47	118.158	145.489	3.092	4.139	249.189	4.121
	194467.		40.64	106.033	129.167	2.693	3.584	151.565	3.729
	237431.		20.82	91.319	109.898	2.212	2.926	67.219	3.228
X9	432457.	19	1.00	59.952	70.480	1.219	1.598	2.083	2.083

WEAPON YIELD = 50.00 KT

A = 13221. FT B = 4526. FT H = 31962. FT

Table C.2 cont'd.

	DOWNWIND DISTANCE X (FEET)		STANDARD INTENSITY (R/HR AT 1 HR)	PARTICLE SIZE RANGE DIAMETER (MICRONS) MIN	MAX	AVERAGE TERMINAL VELOCITY VF(FT/SEC) MIN	MAX	DEPOSITED INITIAL MASS (MG/SQ FT)	MASS CONTOUR RATIO (MG/SQ FT) (R/HR AT 1 HR)
X6	39336.	I6	378.81	438.129	1089.825	12.865	27.439	6222.917	16.427
	42212.		398.45	412.373	946.786	12.174	24.765	5899.563	14.896
	44949.		418.09	390.660	841.483	11.581	22.670	5705.561	13.647
	47560.		437.73	372.092	760.930	11.064	20.982	5594.313	12.780
	50056.		457.37	356.009	697.321	10.611	19.591	5537.647	12.107
	52448.		477.01	341.950	645.844	10.209	18.424	5517.143	11.566
	54743.		496.65	329.529	603.348	9.850	17.430	5519.944	11.114
	56949.		516.29	318.485	567.661	9.528	16.573	5530.753	10.712
	59073.		535.93	308.582	537.248	9.236	15.826	5529.387	10.317
X7	61120.	I7	555.58	299.649	511.069	8.971	15.168	5540.565	9.973
	64980.		527.85	284.261	468.430	8.509	14.068	4962.904	9.402
	69047.		500.12	269.816	431.045	8.070	13.072	4444.399	8.887
	73347.		472.39	256.212	397.975	7.652	12.166	3974.156	8.413
	77906.		444.66	243.355	368.494	7.252	11.335	3541.957	7.966
	82760.		416.93	231.163	341.996	6.868	10.570	3146.677	7.547
	87947.		389.20	219.563	318.005	6.500	9.860	2788.416	7.164
	93518.		361.47	208.489	296.132	6.145	9.200	2430.821	6.808
	99534.		333.75	197.877	276.052	5.802	8.581	2158.432	6.467
	106072.		306.02	187.663	257.494	5.469	7.998	1879.353	6.141
	113232.		278.29	177.790	240.221	5.145	7.446	1622.445	5.830
	121144.		250.56	168.194	224.026	4.828	6.921	1385.806	5.531
	129984.		222.83	158.813	208.716	4.516	6.416	1166.643	5.236
	140001.		195.10	149.572	194.112	4.208	5.928	963.997	4.941
	151556.		167.37	140.382	180.025	3.900	5.451	778.009	4.648
	165209.		139.64	131.128	166.250	3.589	4.979	609.100	4.362
	181894.		111.92	121.642	152.528	3.269	4.504	456.412	4.078
	203354.		84.19	111.650	138.471	2.932	4.013	317.586	3.772
	233470.		56.46	100.605	123.371	2.561	3.482	192.876	3.416
	284394.		28.73	87.025	105.361	2.109	2.847	85.162	2.964
X9	537501.	I9	1.00	56.099	66.222	1.121	1.497	1.864	1.864

WEAPON YIELD = 75.00 KT

A = 15745. FT B = 5111. FT H = 34159. FT

Table C.2 cont'd.

	DOWNWIND DISTANCE X (FEET)		STANDARD INTENSITY (R/HR AT 1 HR)	PARTICLE SIZE RANGE DIAMETER (MICRONS) MIN	MAX	AVERAGE TERMINAL VELOCITY VF(FT/SEC) MIN	MAX	DEPOSITED INITIAL MASS (MG/SQ FT)	MASS CONTOUR RATIO (MG/SQ FT) (R/HR AT 1 HR)
X6	42659.	I6	465.11	412.782	1119.652	12.351	28.439	7196.026	15.472
	46171.		439.87	386.698	948.862	11.624	25.213	6776.327	13.833
	49510.		514.63	364.960	828.477	11.006	22.767	6533.155	12.695
	52692.		539.38	346.537	739.258	10.474	20.847	6397.666	11.861
	55731.		564.14	330.714	670.688	10.010	19.298	6329.268	11.219
	58640.		588.89	316.972	616.259	9.602	18.020	6301.673	10.701
	61429.		613.65	304.904	572.098	9.240	16.948	6279.998	10.234
	64107.		638.40	294.226	535.522	8.917	16.034	6256.604	9.800
	66684.		663.16	284.693	504.719	8.626	15.245	6252.669	9.429
X7	69166.	I7	687.91	276.132	478.445	8.362	14.556	6263.666	9.105
	73404.		653.57	262.761	439.781	7.946	13.517	5630.911	8.616
	77870.		619.22	250.135	405.734	7.550	12.575	5056.408	8.166
	82591.		584.88	238.178	375.497	7.170	11.715	4528.081	7.742
	87598.		550.53	226.819	348.436	6.806	10.925	4042.123	7.344
	92928.		516.18	215.996	324.040	6.456	10.196	3603.117	6.980
	98625.		481.84	205.649	301.883	6.119	9.520	3200.373	6.642
	104743.		447.49	195.725	281.621	5.792	8.889	2828.509	6.321
	111350.		413.15	186.173	262.971	5.474	8.297	2484.346	6.013
	118531.		378.80	176.941	245.688	5.169	7.739	2166.498	5.719
	126395.		344.46	167.973	229.564	4.869	7.210	1873.372	5.439
	135085.		310.11	159.224	214.408	4.575	6.705	1601.669	5.165
	144797.		275.76	150.633	200.047	4.284	6.220	1349.033	4.892
	155802.		241.42	142.139	186.316	3.996	5.750	1115.803	4.622
	168499.		207.07	133.659	173.043	3.708	5.291	901.850	4.355
	183503.		172.73	125.086	160.033	3.416	4.835	707.705	4.097
	201846.		138.38	116.262	147.040	3.115	4.377	530.854	3.836
	225449.		104.04	106.926	133.697	2.798	3.902	369.139	3.548
	258599.		69.69	96.556	119.316	2.446	3.387	223.882	3.212
	314769.		35.35	83.722	102.089	2.016	2.771	98.594	2.789
X9	609738.	I9	1.00	53.356	63.340	1.046	1.421	1.726	1.726

WEAPON YIELD = 100.00 KT

A = 17824. FT B = 5572. FT H = 35810. FT

Table C.2 cont'd.

	DOWNWIND DISTANCE X (FEET)		STANDARD INTENSITY (R/HR AT 1 HR)	PARTICLE SIZE RANGE DIAMETER (MICRONS) MIN	MAX	AVERAGE TERMINAL VELOCITY VF(FT/SEC) MIN	MAX	DEPOSITED INITIAL MASS (MG/SQ FT)	MASS CONTOUR RATIO (MG/SQ FT) (R/HR AT 1 HR)
X6	45186.	I6	537.89	395.248	1148.469	11.985	29.311	7977.456	14.831
	49215.		567.07	369.104	953.527	11.236	25.612	7478.495	13.188
	53042.		596.25	347.469	821.007	10.605	22.881	7196.850	12.070
	56686.		625.43	329.261	725.266	10.065	20.781	7042.775	11.261
	60163.		654.61	313.704	653.006	9.597	19.112	6964.129	10.639
	63490.		683.79	300.255	596.576	9.187	17.753	6920.634	10.121
	66677.		712.97	288.494	551.332	8.825	16.625	6863.687	9.627
	69736.		742.15	278.115	514.229	8.502	15.671	6836.092	9.211
	72677.		771.33	268.885	483.246	8.213	14.854	6830.417	8.855
X7	75509.	I7	800.51	260.616	456.976	7.952	14.146	6840.700	8.545
	80040.		760.53	248.498	420.816	7.566	13.147	6162.130	8.102
	84816.		720.56	237.013	388.903	7.197	12.239	5540.628	7.689
	89864.		680.58	226.097	360.493	6.842	11.409	4966.503	7.297
	95218.		640.61	215.692	334.999	6.502	10.646	4444.702	6.938
	100917.		600.63	205.745	311.958	6.174	9.942	3967.995	6.606
	107009.		560.66	196.206	290.990	5.857	9.287	3528.902	6.294
	113552.		520.68	187.028	271.789	5.551	8.676	3121.679	5.995
	120617.		480.71	178.168	254.080	5.253	8.102	2744.674	5.710
	128296.		440.73	169.579	237.641	4.962	7.560	2396.566	5.438
	136706.		400.75	161.216	222.276	4.678	7.047	2074.125	5.176
	146001.		360.78	153.034	207.812	4.399	6.556	1773.853	4.917
	156388.		320.80	144.979	194.086	4.124	6.084	1495.003	4.660
	168159.		280.83	136.991	180.936	3.850	5.627	1237.557	4.407
	181741.		240.85	128.993	168.205	3.575	5.179	1001.869	4.160
	197793.		200.88	120.884	155.712	3.256	4.735	787.199	3.919
	217420.		160.90	112.513	143.216	3.008	4.288	590.501	3.670
	242682.		120.93	103.628	130.360	2.704	3.824	410.579	3.395
	278180.		80.95	93.724	116.479	2.366	3.321	248.839	3.074
	338401.		40.98	81.412	99.801	1.952	2.718	109.409	2.670
X9	666806.	I9	1.00	51.490	61.393	0.996	1.369	1.634	1.634

WEAPON YIELD = 250.00 KT

A = 26455. FT B = 7335. FT H = 41616. FT

Table C.2 cont'd.

	DOWNWIND DISTANCE X (FEET)		STANDARD INTENSITY (R/HR AT 1 HR)	PARTICLE SIZE RANGE DIAMETER (MICRONS) MIN	MAX	AVERAGE TERMINAL VELOCITY VF(FT/SEC) MIN	MAX	DEPOSITED INITIAL MASS (MG/SQ FT)	MASS CONTOUR RATIO (MG/SQ FT) (R/HR AT 1 HR)
X6	54273.	I6	853.55	342.402	1300.982	10.816	33.437	11077.455	12.978
	60388.		902.86	316.891	989.887	10.022	27.502	10253.138	11.356
	66178.		952.16	296.262	806.377	9.367	23.566	9824.127	10.318
	71675.		1001.47	279.216	686.194	8.817	20.760	9590.801	9.577
	76907.		1050.77	264.875	601.695	8.348	18.657	9379.342	8.926
	81900.		1100.08	252.632	539.067	7.944	17.019	9233.750	8.394
	86674.		1149.38	242.047	490.871	7.591	15.706	9147.679	7.959
	91248.		1198.69	232.795	452.636	7.280	14.629	9100.814	7.592
	95637.		1247.99	224.630	421.526	7.004	13.729	9081.933	7.277
X7	99855.	I7	1297.30	217.369	395.750	6.757	12.965	9077.927	6.998
	105481.		1232.48	208.472	366.325	6.453	12.072	8210.533	6.662
	111411.		1167.67	199.947	340.160	6.159	11.258	7420.305	6.355
	117680.		1102.85	191.760	316.706	5.876	10.512	6694.035	6.070
	124328.		1038.04	183.876	295.528	5.602	9.825	6021.439	5.801
	131405.		973.22	176.264	276.272	5.336	9.188	5395.224	5.544
	138970.		908.41	168.894	258.656	5.077	8.594	4813.020	5.298
	147095.		843.59	161.738	242.435	4.825	8.039	4272.959	5.065
	155870.		778.78	154.765	227.400	4.579	7.517	3770.459	4.841
	165409.		713.96	147.947	213.377	4.338	7.023	3300.522	4.623
	175855.		649.15	141.251	200.212	4.101	6.553	2860.681	4.407
	187401.		584.33	134.644	187.763	3.866	6.104	2451.168	4.195
	200306.		519.52	128.084	175.897	3.633	5.671	2071.344	3.987
	214933.		454.70	121.523	164.483	3.400	5.250	1722.430	3.788
	231814.		389.89	114.899	153.386	3.165	4.838	1400.954	3.593
	251770.		325.07	108.124	142.443	2.928	4.429	1102.949	3.393
	276179.		260.26	101.068	131.444	2.677	4.015	827.107	3.178
	307617.		195.44	93.506	120.068	2.412	3.585	574.403	2.939
	351843.		130.63	84.988	107.706	2.117	3.117	348.566	2.668
	427090.		65.82	74.251	92.724	1.751	2.553	152.388	2.315
X9	886663.	I9	1.00	45.952	55.656	0.849	1.218	1.465	1.465

WEAPON YIELD = 500.00 KT

A = 35666. FT B = 9030. FT M = 46626. FT

Table C.2 cont'd.

	DOWNWIND DISTANCE X (FEET)		STANDARD INTENSITY (R/HR AT 1 HR)	PARTICLE SIZE RANGE DIAMETER (MICRONS) MIN	MAX	AVERAGE TERMINAL VELOCITY VF(FT/SEC) MIN	MAX	DEPOSITED INITIAL MASS (MG/SQ FT)	MASS CONTOUR RATIO (MG/SQ FT) (R/HR AT 1 HR)
X6	62344.	I6	1208.89	305.279	1538.723	9.937	38.980	14197.521	11.744
	70593.		1282.25	281.024	1053.197	9.128	29.894	13034.603	10.165
	78384.		1355.61	261.701	809.562	8.473	24.534	12453.409	9.187
	85763.		1428.97	245.917	664.759	7.930	20.993	12018.168	8.410
	92774.		1502.33	232.773	569.314	7.473	18.475	1.707.181	7.793
	99450.		1575.69	221.634	501.803	7.083	16.591	11511.703	7.306
	105822.		1649.06	212.066	451.591	6.745	15.126	11388.870	6.906
	111916.		1722.42	203.748	412.772	6.450	13.954	11306.573	6.564
	117757.		1795.78	196.444	381.840	6.189	12.993	11263.748	6.272
X7	123363.	I7	1869.14	189.974	356.607	5.957	12.190	11262.615	6.026
	130009.		1775.73	182.907	331.148	5.703	11.361	10237.973	5.766
	137014.		1682.32	176.086	308.408	5.457	10.605	9288.195	5.521
	144420.		1588.92	169.485	287.940	5.218	9.910	8401.564	5.288
	152274.		1495.51	163.080	269.390	4.986	9.269	7575.013	5.065
	160635.		1402.10	156.852	252.470	4.759	8.675	6805.450	4.854
	169573.		1308.70	150.783	236.939	4.538	8.120	6088.475	4.652
	179172.		1215.29	144.852	222.589	4.322	7.601	5417.493	4.458
	189540.		1121.88	139.037	209.251	4.109	7.112	4785.799	4.266
	200810.		1028.48	133.315	196.777	3.900	6.649	4194.227	4.078
	213153.		935.07	127.661	185.031	3.694	6.208	3641.753	3.895
	226797.		841.66	122.047	173.892	3.489	5.786	3127.934	3.716
	242047.		748.25	116.440	163.246	3.285	5.379	2653.668	3.546
	259333.		654.85	110.798	152.979	3.080	4.983	2213.552	3.380
	279284.		561.44	105.066	142.967	2.873	4.595	1802.589	3.211
	302874.		468.03	99.168	133.065	2.660	4.209	1419.039	3.032
	331733.		374.63	92.984	123.083	2.438	3.818	1063.684	2.839
	368912.		281.22	86.311	112.722	2.202	3.412	739.150	2.628
	421246.		187.81	78.734	101.415	1.936	2.970	448.929	2.390
	510417.		94.41	69.093	87.633	1.605	2.434	195.567	2.072
X9	1099965.	I9	1.00	42.739	51.770	0.750	1.117	1.384	1.384

WEAPON YIELD = 750.00 KT

A = 42477. FT B = 10198. FT H = 49832. FT

Table C.2 cont'd.

	DOWNWIND DISTANCE X (FEET)		STANDARD INTENSITY (R/HR AT 1 HR)	PARTICLE SIZE RANGE DIAMETER (MICRONS) MIN	MAX	AVERAGE TERMINAL VELOCITY VF(FT/SEC) MIN	MAX	DEPOSITED INITIAL MASS (MG/SQ FT)	MASS CONTOUR RATIO (MG/SQ FT) (R/HR AT 1 HR)
X6	67610.	I6	1481.17	284.784	1788.440	9.427	44.152	16413.254	11.081
	77390.		1573.73	261.468	1115.052	8.618	31.929	15004.603	9.534
	86610.		1666.30	243.042	819.320	7.969	25.365	14291.677	8.577
	95332.		1758.86	228.086	655.777	7.434	21.261	13699.890	7.789
	103606.		1851.43	215.688	552.745	6.990	18.449	13333.273	7.202
	111477.		1944.00	205.226	482.088	6.610	16.399	13097.446	6.737
	118981.		2036.56	196.267	430.653	6.284	14.836	12934.868	6.351
	126152.		2129.13	188.503	391.554	5.999	13.604	12834.658	6.028
	133017.		2221.69	181.699	360.813	5.749	12.607	12797.566	5.760
X7	139603.	I7	2314.26	175.682	335.996	5.527	11.782	12802.686	5.532
	146937.		2198.60	169.501	312.527	5.298	10.985	11659.960	5.303
	154668.		2082.93	163.508	291.520	5.078	10.286	10891.695	5.085
	162840.		1967.27	157.686	272.582	4.860	9.588	9594.942	4.877
	171508.		1851.61	152.018	255.384	4.649	8.970	8665.531	4.680
	180735.		1735.95	146.487	239.666	4.444	8.397	7797.915	4.492
	190599.		1620.28	141.075	225.215	4.242	7.863	6984.476	4.311
	201193.		1504.62	135.766	211.843	4.045	7.362	6217.146	4.132
	212636.		1388.96	130.542	199.392	3.850	6.899	5496.968	3.958
	225073.		1273.29	125.383	187.729	3.658	6.443	4822.654	3.788
	238696.		1157.63	120.267	176.731	3.468	6.018	4193.023	3.622
	253754.		1041.97	115.169	166.285	3.280	5.610	3610.458	3.465
	270586.		926.30	110.059	156.287	3.091	5.217	3068.434	3.313
	289666.		810.64	104.899	146.630	2.901	4.835	2562.007	3.160
	311688.		694.98	99.638	137.199	2.708	4.459	2085.926	3.001
	337728.		579.32	94.205	127.857	2.511	4.096	1642.222	2.835
	369587.		463.65	88.487	118.423	2.304	3.708	1230.697	2.654
	410638.		347.99	82.291	108.612	2.082	3.315	856.354	2.461
	468435.		232.33	75.224	97.882	1.833	2.886	519.805	2.237
	565976.		116.66	66.131	84.762	1.522	2.367	226.316	1.940
X9	1247793.	I9	1.00	42.458	49.648	0.697	1.042	1.339	1.339

WEAPON YIELD = 1000.00 KT

A = 48084. FT B = 11117. FT H = 52240. FT

Table C.2 cont'd.

	DOWNWIND DISTANCE X (FEET)		STANDARD INTENSITY (R/HR AT 1 HR)	PARTICLE SIZE RANGE DIAMETER (MICRONS) MIN	MAX	AVERAGE TERMINAL VELOCITY VF(FT/SEC) MIN	MAX	DEPOSITED INITIAL MASS (MG/SQ FT)	MASS CONTOUR RATIO (MG/SQ FT) (R/HR AT 1 HR)
X6	71614.	I6	1710.43	270.879	2063.091	9.067	49.376	18190.455	10.636
	82627.		1819.60	248.298	1175.970	8.283	33.800	16581.250	9.113
	92998.		1928.77	230.545	830.944	7.621	26.114	15699.660	8.140
	102798.		2037.95	216.196	651.468	7.096	21.526	15035.086	7.378
	112086.		2147.12	204.335	542.355	6.659	18.473	14620.705	6.809
	120914.		2256.29	194.355	469.266	6.288	16.292	14346.811	6.359
	129324.		2365.46	185.826	416.938	5.970	14.654	14154.454	5.984
	137355.		2474.63	178.444	377.626	5.694	13.377	14054.929	5.680
	145039.		2583.80	171.987	347.010	5.452	12.353	14019.287	5.426
X7	152405.	I7	2692.97	166.284	322.472	5.237	11.512	14026.409	5.209
	160274.		2558.38	160.657	300.269	5.025	10.734	12785.948	4.998
	168569.		2423.78	155.187	280.367	4.819	10.024	11626.969	4.797
	177337.		2289.18	149.858	262.397	4.618	9.372	10544.970	4.606
	186637.		2154.58	144.656	246.063	4.421	8.770	9534.973	4.425
	196537.		2019.98	139.567	231.124	4.229	8.211	8587.569	4.251
	207120.		1885.38	134.575	217.369	4.041	7.689	7693.906	4.081
	218487.		1750.78	129.666	204.627	3.855	7.200	6852.683	3.914
	230764.		1616.18	124.823	192.756	3.673	6.740	6061.304	3.752
	244109.		1481.59	120.029	181.623	3.493	6.303	5324.294	3.594
	258726.		1346.99	115.263	171.114	3.314	5.888	4636.980	3.442
	274884.		1212.39	110.503	161.125	3.136	5.490	3998.024	3.296
	292944.		1077.79	105.721	151.555	2.957	5.106	3401.202	3.156
	313417.		943.19	100.880	142.302	2.778	4.733	2839.392	3.010
	337247.		808.59	95.932	133.258	2.595	4.366	2312.391	2.860
	364991.		673.99	90.809	124.291	2.407	4.001	1819.940	2.700
	399180.		539.39	85.403	115.225	2.211	3.632	1364.297	2.529
	443236.		404.80	79.530	105.786	2.000	3.248	950.276	2.348
	505274.		270.20	72.809	95.449	1.762	2.828	576.424	2.133
	611085.		135.60	64.175	82.781	1.464	2.321	251.015	1.851
X9	1364578.	I9	1.00	42.340	48.215	0.661	1.025	1.307	1.307

WEAPON YIELD = 2500.00 KT

A = 71369. FT B = 14635. FT M = 60710. FT

Table C.2 cont'd.

	DOWNWIND DISTANCE X (FEET)		STANDARD INTENSITY (R/HR AT 1 HR)	PARTICLE SIZE RANGE DIAMETER (MICRONS) MIN	MAX	AVERAGE TERMINAL VELOCITY VF(FT/SEC) MIN	MAX	DEPOSITED INITIAL MASS (MG/SQ FT)	MASS CONTOUR RATIO (MG/SQ FT) (R/HR AT 1 HR)
X6	86018.	I8	2702.08	229.944	5322.364	7.946	91.720	25220.916	9.334
	101949.		2886.71	210.002	1576.459	7.170	44.213	22773.800	7.889
	116892.		3071.34	194.544	912.473	6.563	29.871	21165.145	6.891
	130962.		3255.98	182.177	653.517	6.075	22.939	20198.903	6.204
	144256.		3440.61	172.038	517.899	5.673	18.846	19556.306	5.684
	156855.		3625.24	163.558	434.921	5.336	16.140	19147.249	5.282
	168828.		3809.88	156.348	379.004	5.049	14.216	18919.796	4.966
	180234.		3994.51	150.133	338.753	4.802	12.775	18797.146	4.706
	191125.		4179.14	144.715	308.389	4.588	11.655	18747.906	4.486
X7	201545.	I7	4363.77	139.942	284.631	4.396	10.758	18759.351	4.299
	211414.		4145.63	135.761	265.734	4.230	10.030	17164.138	4.140
	221817.		3927.50	131.643	248.754	4.067	9.366	15664.335	3.988
	232814.		3709.36	127.609	233.384	3.907	8.756	14247.921	3.841
	244478.		3491.22	123.640	219.381	3.751	8.194	12907.006	3.697
	256895.		3273.08	119.726	206.542	3.596	7.672	11642.658	3.557
	270169.		3054.94	115.859	194.694	3.444	7.185	10452.284	3.421
	284426.		2836.80	112.027	183.695	3.294	6.729	9333.614	3.290
	299825.		2618.66	108.218	173.422	3.146	6.299	8290.645	3.166
	316564.		2400.53	104.421	163.767	2.998	5.892	7313.734	3.047
	334899.		2182.39	100.619	154.633	2.851	5.505	6395.393	2.930
	355166.		1964.25	96.793	145.930	2.704	5.134	5525.507	2.813
	377821.		1746.11	92.920	137.574	2.556	4.776	4702.187	2.693
	403504.		1527.97	88.972	129.475	2.406	4.428	3926.417	2.570
	433150.		1309.83	84.906	121.539	2.253	4.086	3196.374	2.440
	468209.		1091.69	80.662	113.648	2.094	3.746	2517.672	2.306
	511109.		873.55	76.149	105.646	1.928	3.402	1392.819	2.167
	566401.		655.42	71.202	97.286	1.748	3.044	1317.662	2.010
	644287.		437.28	65.486	88.091	1.546	2.653	798.236	1.825
	777246.		219.14	58.053	78.754	1.288	2.178	348.602	1.591
X9	1814498.	I9	1.00	41.894	43.952	0.557	0.917	1.209	1.209

WEAPON YIELD = 5000.00 KT

A = 96218. FT B = 18017. FT M = 68019. FT

Table C.2 cont'd.

	DOWNWIND DISTANCE X (FEET)		STANDARD INTENSITY (R/HR AT 1 HR)	PARTICLE SIZE RANGE DIAMETER (MICRONS) MIN	MAX	AVERAGE TERMINAL VELOCITY VF(FT/SEC) MIN	MAX	DEPOSITED INITIAL MASS (MG/SQ FT)	MASS CONTOUR RATIO (MG/SQ FT) (R/HR AT 1 HR)
X6	98808.	16	3814.61	202.443	43043.179	7.128	578.206	32261.715	8.457
	119711.		4089.29	184.613	2576.643	6.390	64.238	28685.211	7.015
	139253.		4363.98	170.904	1062.061	5.819	35.307	26492.326	6.071
	157603.		4638.67	160.004	678.761	5.365	24.908	25170.544	5.426
	174896.		4913.35	151.106	510.043	4.994	19.545	24331.991	4.952
	191249.		5188.04	143.688	415.953	4.686	16.267	23849.120	4.597
	206757.		5462.72	137.398	356.058	4.424	14.052	23556.208	4.312
	221505.		5737.41	131.988	314.583	4.200	12.454	23403.145	4.079
	235563.		6012.10	127.278	284.129	4.006	11.244	23365.396	3.886
X7	248992.	17	6286.78	123.135	260.793	3.835	10.295	23402.682	3.723
	260731.		5972.49	119.768	243.791	3.697	9.592	21448.073	3.591
	273105.		5658.20	116.449	228.506	3.561	8.951	19596.254	3.463
	286187.		5343.92	113.170	214.667	3.427	8.363	17846.409	3.340
	300061.		5029.63	109.927	202.051	3.295	7.822	16194.901	3.220
	314831.		4715.34	106.712	190.473	3.165	7.320	14638.496	3.104
	330620.		4401.05	103.518	179.782	3.037	6.853	13183.205	2.995
	347580.		4086.76	100.336	169.849	2.909	6.416	11815.418	2.891
	365897.		3772.47	97.156	160.563	2.782	6.005	10525.332	2.790
	385809.		3458.18	93.969	151.828	2.656	5.616	9301.434	2.690
	407619.		3143.89	90.761	143.556	2.530	5.246	8134.798	2.587
	431728.		2829.60	87.516	135.666	2.403	4.891	7029.633	2.484
	458679.		2515.31	84.215	128.082	2.275	4.550	5982.041	2.378
	489232.		2201.02	80.830	120.724	2.145	4.218	4993.743	2.269
	524500.		1886.73	77.326	113.502	2.012	3.893	4070.751	2.158
	566209.		1572.45	73.648	106.311	1.874	3.569	3213.068	2.043
	617251.		1258.16	69.714	99.006	1.728	3.241	2414.259	1.919
	683042.		943.87	65.373	91.357	1.570	2.901	1679.594	1.779
	778732.		629.58	60.322	82.920	1.390	2.529	1018.933	1.618
	934032.		315.29	53.697	72.476	1.161	2.077	446.062	1.415
X9	2251021.	19	1.00	40.251	42.624	0.487	0.845	1.139	1.139

WEAPON YIELD = 7500.00 KT

A = 114591. FT B = 20348. FT H = 72696. FT

Table C.2 cont'd.

	DOWNWIND DISTANCE X (FEET)		STANDARD INTENSITY (R/HR AT 1 HR)	PARTICLE SIZE RANGE DIAMETER (MICRONS) MIN	MAX	AVERAGE TERMINAL VELOCITY VF(FT/SEC) MIN	MAX	DEPOSITED INITIAL MASS (MG/SQ FT)	MASS CONTOUR RATIO (MG/SQ FT) (R/HR AT 1 HR)
X6	107155.	I6	4606.26	187.707		6.664		36768.369	7.982
	131735.		4959.30	171.034	4640.304	5.949	93.830	32389.572	6.531
	154624.		5312.33	158.299	1222.078	5.402	40.488	29876.700	5.624
	176040.		5665.36	148.217	705.512	4.970	26.559	28349.008	5.004
	196161.		6018.40	140.015	509.156	4.619	20.134	27472.414	4.565
	215135.		6371.43	133.195	406.932	4.328	16.429	26956.826	4.231
	233085.		6724.46	127.423	344.386	4.083	14.014	26664.045	3.965
	250117.		7077.50	122.467	302.148	3.874	12.312	26548.165	3.751
	266319.		7430.53	118.158	271.669	3.692	11.047	26546.545	3.573
X7	281769.	I7	7783.56	114.372	248.604	3.534	10.068	26608.593	3.419
	294773.		7394.43	111.402	232.499	3.410	9.373	24403.880	3.300
	308480.		7005.31	108.466	218.028	3.288	8.741	22318.912	3.186
	322971.		6616.18	105.558	204.930	3.167	8.163	20349.390	3.076
	338340.		6227.05	102.672	192.991	3.049	7.630	18494.007	2.970
	354701.		5837.92	99.803	182.036	2.931	7.138	16756.271	2.870
	372191.		5448.79	96.943	171.921	2.815	6.679	15117.976	2.775
	390978.		5059.67	94.087	162.522	2.699	6.251	13568.696	2.682
	411269.		4670.54	91.224	153.735	2.584	5.848	12093.310	2.589
	433326.		4281.41	88.347	145.466	2.469	5.468	10685.084	2.496
	457486.		3892.28	85.441	137.634	2.354	5.106	9347.722	2.402
	484193.		3503.15	82.495	130.161	2.238	4.760	8076.359	2.305
	514049.		3114.03	79.488	122.973	2.120	4.427	6872.331	2.207
	547894.		2724.90	76.396	115.995	2.001	4.104	5741.774	2.107
	586964.		2335.77	73.184	109.142	1.878	3.787	4686.344	2.006
	633171.		1946.64	69.804	102.313	1.751	3.472	3698.085	1.900
	689717.		1557.51	66.173	95.369	1.616	3.153	2777.798	1.783
	762605.		1168.38	62.155	88.091	1.470	2.821	1932.040	1.654
	865304.		779.26	57.460	80.052	1.303	2.460	1174.374	1.507
	1040728.		390.13	51.270	70.083	1.090	2.021	514.783	1.320
X9	2553547.	I9	1.00	38.577	42.459	0.450	0.805	1.099	1.099

WEAPON YIELD = 10000.00 KT

A = 129718. FT B = 22182. FT H = 76208. FT

Table C.2 cont'd.

	DOWNWIND DISTANCE X (FEET)		STANDARD INTENSITY (R/HR AT 1 HR)	PARTICLE SIZE RANGE DIAMETER (MICRONS) MIN	MAX	AVERAGE TERMINAL VELOCITY VF(FT/SEC) MIN	MAX	DEPOSITED INITIAL MASS (MG/SQ FT)	MASS CONTOUR RATIO (MG/SQ FT) (R/HR AT 1 HR)
X6	113501.	I6	5248.17	177.847		6.343		40202.670	7.660
	141089.		5671.37	161.964	10274.422	5.646	147.990	35186.981	6.204
	166690.		6094.57	149.893	1405.757	5.116	45.887	32432.536	5.322
	190572.		6517.77	140.372	733.793	4.700	28.085	30787.357	4.724
	212951.		6940.97	132.645	511.211	4.364	20.672	29885.823	4.306
	234005.		7364.17	126.233	401.856	4.086	16.600	29356.831	3.986
	253882.		7787.37	120.813	337.043	3.853	14.021	29091.636	3.736
	272708.		8210.57	116.164	294.140	3.653	12.238	29010.312	3.533
	290586.		8633.77	112.125	263.588	3.481	10.929	29031.845	3.363
X7	307610.	I7	9056.97	108.579	240.690	3.331	9.927	29131.272	3.216
	321597.		8604.17	105.860	225.141	3.217	9.236	26737.058	3.107
	336341.		8151.37	103.167	211.177	3.104	8.608	24473.513	3.002
	351928.		7698.57	100.494	198.542	2.992	8.034	22338.971	2.902
	368460.		7245.77	97.835	187.027	2.882	7.506	20338.052	2.807
	386059.		6792.98	95.186	176.466	2.773	7.018	18449.719	2.716
	404873.		6340.18	92.542	166.714	2.664	6.565	16662.233	2.628
	425081.		5887.38	89.894	157.654	2.556	6.142	14959.991	2.541
	446909.		5434.58	87.236	149.184	2.449	5.745	13330.938	2.453
	470634.		4981.78	84.559	141.213	2.341	5.369	11781.180	2.365
	496622.		4528.98	81.850	133.662	2.233	5.013	10305.995	2.276
	525351.		4076.19	79.098	126.458	2.125	4.673	8903.009	2.184
	557465.		3623.39	76.283	119.530	2.014	4.345	7578.381	2.092
	593873.		3170.59	73.382	112.801	1.902	4.027	6338.362	1.999
	635900.		2717.79	70.364	106.191	1.787	3.715	5174.892	1.904
	685605.		2264.99	67.179	99.601	1.667	3.405	4081.769	1.802
	746433.		1812.19	63.752	92.896	1.540	3.092	3065.483	1.692
	824843.		1359.40	59.948	85.863	1.401	2.767	2133.492	1.569
	935326.		906.60	55.491	78.088	1.243	2.412	1298.123	1.432
	1124068.		453.80	49.595	68.430	1.041	1.982	569.605	1.255
X9	2792543.	I9	1.00	37.410	42.350	0.425	0.779	1.072	1.072

WEAPON YIELD = 25000.00 KT

A = 192536. FT B = 29200. FT H = 88565. FT

Table C.2 cont'd.

	DOWNWIND DISTANCE X (FEET)		STANDARD INTENSITY (R/HR AT 1 HR)	PARTICLE SIZE RANGE DIAMETER (MICRONS) MIN	MAX	AVERAGE TERMINAL VELOCITY VF(FT/SEC) MIN	MAX	DEPOSITED INITIAL MASS (MG/SQ FT)	MASS CONTOUR RATIO (MG/SQ FT) (R/HR AT 1 HR)
X6	136329.	I6	8008.44	149.583		5.367		53725.124	6.709
	175832.		8749.09	136.172		4.737		45980.097	5.255
	212124.		9489.75	126.100	418I.152	4.268	100.017	42138.687	4.440
	245687.		10230.41	118.220	941.644	3.905	37.199	40180.735	3.928
	276903.		.09T1.07	111.863	544.244	3.616	23.630	39105.767	3.564
	306078.		11711.72	106.608	397.082	3.379	17.689	38597.520	3.296
	333464.		12452.38	102.181	320.807	3.181	14.349	38386.033	3.083
	359268.		13193.04	98.392	274.076	3.014	12.203	38376.852	2.909
	383661.		13933.70	95.105	242.422	2.870	10.706	38537.881	2.766
X7	406791.	I7	14674.35	92.224	219.498	2.745	9.609	38858.467	2.648
	424468.		13940.69	90.159	205.230	2.656	8.903	35809.042	2.569
	443101.		13207.02	88.100	192.466	2.568	8.274	32919.247	2.493
	462799.		12473.35	86.045	180.956	2.480	7.702	30172.079	2.419
	483691.		11739.68	83.988	170.500	2.394	7.180	27540.616	2.346
	505932.		11006.02	81.927	160.929	2.307	6.699	25014.695	2.273
	529708.		10272.35	79.856	152.110	2.221	6.255	22601.227	2.200
	555247.		9538.68	77.772	143.928	2.135	5.842	20294.222	2.128
	582830.		8805.01	75.665	136.286	2.050	5.456	18084.034	2.054
	612815.		8071.35	73.531	129.101	1.963	5.092	15980.389	1.980
	645659.		7337.68	71.360	122.298	1.876	4.748	13986.928	1.906
	681966.		6604.01	69.138	115.808	1.788	4.421	12109.115	1.834
	722554.		5870.34	66.854	109.565	1.699	4.106	10328.671	1.759
	768566.		5136.67	64.484	103.499	1.607	3.802	8639.204	1.682
	821683.		4403.01	62.003	97.538	1.513	3.505	7047.228	1.601
	884504.		3669.34	59.367	91.590	1.414	3.211	5556.251	1.514
	961386.		2935.67	56.511	85.526	1.309	2.914	4178.678	1.423
	1060496.		2202.00	53.317	79.150	1.194	2.606	2918.101	1.325
	1200161.		1468.34	49.543	72.083	1.062	2.271	1780.207	1.212
	1438818.		734.67	44.493	63.271	0.892	1.866	783.880	1.067
X9	3713293.	I9	1.00	33.816	42.032	0.351	0.701	0.987	0.987

WEAPON YIELD = 50000.00 KT

A = 25957.4 FT B = 35949.4 FT H = 99227.4 FT

Table C.2 cont'd.

	DOWNWIND DISTANCE X (FEET)		STANDARD INTENSITY (R/HR AT 1 HR)	PARTICLE SIZE RANGE DIAMETER (MICRONS) MIN	MAX	AVERAGE TERMINAL VELOCITY VF(FT/SEC) MIN	MAX	DEPOSITED INITIAL MASS (MG/SQ FT)	MASS CONTOUR RATIO (MG/SQ FT) (R/HR AT 1 HR)
X6	156601.	I6	11099.39	131.140		4.681		67078.748	6.043
	208028.		12214.86	119.479		4.110		56372.340	4.615
	254958.		13330.33	110.767		3.690		51550.333	3.867
	298114.		14445.81	103.973	1531.618	3.368	57.185	49169.052	3.404
	338058.		15561.28	98.503	622.618	3.113	28.353	47993.679	3.084
	375236.		16676.76	93.987	410.569	2.905	19.407	47411.711	2.843
	410006.		17792.23	90.186	317.377	2.733	15.038	47231.792	2.655
	442661.		18907.70	86.934	264.879	2.588	12.444	47390.915	2.506
	473444.		20023.18	84.115	231.071	2.463	10.722	47840.246	2.389
X7	502557.	I7	21138.65	81.644	207.388	2.355	9.494	48460.917	2.293
	529694.		20081.77	79.957	193.596	2.282	8.770	44746.225	2.228
	545974.		19024.89	78.267	181.327	2.209	8.123	41166.010	2.164
	569528.		17968.00	76.574	170.314	2.137	7.539	37736.792	2.100
	594510.		16911.12	74.873	160.345	2.065	7.009	34451.141	2.037
	621104.		15854.24	73.162	151.250	1.993	6.524	31294.147	1.974
	649534.		14797.36	71.435	142.892	1.921	6.078	28269.555	1.910
	680072.		13740.47	69.689	135.157	1.850	5.665	25383.667	1.847
	713055.		12683.59	67.918	127.946	1.777	5.281	22646.254	1.785
	748909.		11626.71	66.116	121.177	1.705	4.921	20047.103	1.724
	788183.		10569.83	64.275	114.776	1.631	4.582	17571.635	1.662
	831597.		9512.94	62.385	108.574	1.557	4.260	15207.803	1.599
	880130.		8456.06	60.431	102.794	1.481	3.952	12963.136	1.533
	935151.		7399.18	58.398	97.081	1.403	3.655	10839.506	1.465
	998667.		6342.30	56.256	91.467	1.323	3.366	8841.692	1.394
	1073789.		5285.41	53.971	85.865	1.238	3.080	6986.629	1.322
	1165727.		4228.53	51.483	80.156	1.148	2.793	5265.289	1.245
	1284247.		3171.65	48.685	74.155	1.049	2.496	3663.416	1.161
	1451274.		2114.77	45.356	67.498	0.934	2.174	2251.981	1.065
	1736724.		1057.88	42.603	59.187	0.787	1.765	999.073	0.944
X9	4605489.	I9	1.00	31.218	41.807	0.301	0.649	0.927	0.926

WEAPON YIELD = 75000.00 KT

A = 309137. FT B = 40595. FT H = 106050. FT

Table C.2 cont'd.

	DOWNWIND DISTANCE X (FEET)		STANDARD INTENSITY (R/HR AT 1 HR)	PARTICLE SIZE RANGE DIAMETER (MICRONS) MIN	MAX	AVERAGE TERMINAL VELOCITY VF(FT/SEC) MIN	MAX	DEPOSITED INITIAL MASS (MG/SQ FT)	MASS CONTOUR RATIO (MG/SQ FT) (R/HR AT 1 HR)
X6	169829.	I6	13467.33	121.433		4.303		76117.660	5.652
	229670.		14878.68	110.714		3.768		63433.154	4.263
	284083.		16290.03	102.722		3.377		58000.918	3.561
	333973.		17701.37	96.499	3075.446	3.078	94.491	55347.137	3.127
	380034.		19112.72	91.490	720.962	2.842	33.452	54037.433	2.827
	422811.		20524.06	87.357	430.123	2.651	21.061	53412.303	2.602
	462742.		21935.41	83.878	320.176	2.493	15.719	53328.819	2.431
	500183.		23346.75	80.903	262.289	2.359	12.736	53701.132	2.300
	535425.		24758.10	78.324	226.389	2.245	10.828	54332.337	2.195
X7	568713.	I7	26169.44	76.063	201.834	2.146	9.500	55057.748	2.104
	592195.		24861.02	74.560	188.097	2.081	8.750	50833.045	2.045
	616946.		23552.60	73.052	175.934	2.016	8.083	46780.330	1.986
	643113.		22244.18	71.536	165.052	1.952	7.484	42885.106	1.928
	670866.		20935.75	70.010	155.231	1.887	6.943	39139.470	1.870
	700411.		19627.33	68.471	146.295	1.823	6.451	35555.468	1.812
	731994.		18318.91	66.915	138.102	1.759	6.000	32138.505	1.754
	765920.		17010.49	65.338	130.532	1.694	5.584	28893.612	1.699
	802562.		15702.07	63.736	123.487	1.629	5.198	25800.414	1.643
	842394.		14393.64	62.101	116.383	1.564	4.837	22839.376	1.587
	886024.		13085.22	60.427	110.643	1.498	4.499	20009.176	1.529
	934255.		11776.80	58.705	104.703	1.430	4.178	17314.483	1.470
	988172.		10468.38	56.922	98.988	1.362	3.873	14756.613	1.410
	1049298.		9159.96	55.059	93.422	1.291	3.579	12340.502	1.347
	1119861.		7851.53	53.096	87.955	1.218	3.293	10084.596	1.284
	1203317.		6543.11	50.993	82.502	1.141	3.011	7975.322	1.219
	1305457.		5234.69	48.698	76.947	1.059	2.728	6016.018	1.149
	1437131.		3926.27	46.110	71.114	0.968	2.436	4213.202	1.073
	1622697.		2617.84	43.019	64.648	0.863	2.121	2579.251	0.985
	1939851.		1309.42	42.387	56.575	0.728	1.740	1195.298	0.913
X9	5225582.	I9	1.00	29.736	40.657	0.275	0.621	0.892	0.892

WEAPON YIELD =100000.00 KT

A = 349945. FT B = 44259. FT H = 111173. FT

Table C.2 cont'd.

	DOWNWIND DISTANCE X (FEET)		STANDARD INTENSITY (R/HR AT 1 HR)	PARTICLE SIZE RANGE DIAMETER (MICRONS) MIN	MAX	AVERAGE TERMINAL VELOCITY VF(FT/SEC) MIN	MAX	DEPOSITED INITIAL MASS (MG/SQ FT)	MASS CONTOUR RATIO (MG/SQ FT) (R/HR AT 1 HR)
X6	179887.	I6	15463.61	114.985		4.045		83268.317	5.385
	246443.		17128.65	104.908		3.536		68973.458	4.027
	306821.		18793.69	97.394		3.165		63035.108	3.354
	362069.		20458.74	91.541	10793.289	2.883	202.286	60183.775	2.942
	412992.		22123.78	86.835	845.757	2.660	39.339	58735.044	2.655
	460219.		23788.82	82.953	452.543	2.480	22.718	58109.623	2.443
	504249.		25453.86	79.685	325.086	2.331	16.383	58179.057	2.286
	545488.		27118.90	76.889	261.940	2.206	13.033	58689.151	2.164
	584269.		28783.94	74.466	224.011	2.099	10.957	59384.870	2.063
X7	620869.	I7	30448.98	72.340	198.573	2.006	9.541	60182.945	1.977
	646177.		28926.58	70.954	184.754	1.946	8.766	55574.518	1.921
	672853.		27404.18	69.561	172.565	1.887	8.079	51134.375	1.866
	701055.		25881.78	68.159	161.703	1.827	7.466	46669.256	1.811
	730967.		24359.38	66.746	151.931	1.768	6.914	42785.403	1.756
	762810.		22836.98	65.318	143.063	1.708	6.414	38892.634	1.703
	796850.		21314.58	63.872	134.950	1.649	5.957	35167.522	1.651
	833414.		19792.19	62.404	127.447	1.589	5.536	31649.749	1.599
	872907.		18269.79	60.910	120.471	1.529	5.148	28254.873	1.547
	915837.		16747.39	59.384	113.939	1.468	4.786	25005.088	1.493
	962861.		15224.99	57.819	107.773	1.407	4.447	21903.948	1.439
	1014844.		13702.59	56.206	101.906	1.344	4.126	18952.121	1.383
	1072955.		12180.19	54.534	96.275	1.281	3.821	16151.291	1.326
	1138836.		10657.79	52.784	90.813	1.215	3.528	13526.417	1.269
	1214888.		9135.39	50.936	85.451	1.146	3.244	11059.790	1.211
	1304838.		7612.99	48.954	80.075	1.074	2.965	8751.878	1.150
	1414924.		6090.60	46.786	74.607	0.998	2.685	6606.353	1.085
	1536843.		4568.20	44.336	68.858	0.913	2.396	4630.312	1.014
	1756852.		3045.80	42.663	62.522	0.815	2.085	2837.203	0.932
	2098698.		1523.40	42.241	54.629	0.687	1.710	1357.727	0.891
X9	5714654.	I9	1.00	28.704	39.156	0.257	0.602	0.869	0.868

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